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No. II. OF VOL. I., 1931. **LONDON, SATURDAY, JANUARY 10, 1931** **Pp. 120—Price 1s.**

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By Leonard G. Parsons, M.D., F.R.C.P. Lond.,
PHYSICIAN TO THE CHILDREN'S AND GENERAL HOSPITAL, BIRMINGHAM; PROFESSOR OF DISEASES OF CHILDREN IN THE UNIVERSITY OF BIRMINGHAM.

In the year 1725 what was probably the first case of cœliac disease was shown to the Society for Children's Diseases in Jena, but the first description of the disorder was in a short paper by Samuel Gee in the year 1888 "On the Cœliac Affection." This paper, comprising but three pages in the St. Bartholomew's Hospital Reports, is a model of clinical observation and, as far as the description of the digestive and many of the general symptoms is concerned, very little has been added to it by later writers. Following on this communication a few cases were reported by R. A. Gibbons and by W. B. Cheadle (under the title of Acholia) and, in all probability, some of the cases of pancreatic infantilism described by Byrom Bramwell were examples of cœliac disease. The next important contribution was made by C. A. Herter in America in 1908, who in his monograph "Infantilism from Chronic Intestinal Infection" has been accused of rediscovering the disease. Within recent years the writings of G. F. Still, R. Miller, H. Lehndorff, and H. Mauntner have led to a wider recognition of the disorder. On the Continent of Europe the condition is frequently called Heubner-Herter disease, but there can be no doubt that if any one name is attached to this disease it should surely be that of Gee.

Clinical Features.

This disease which occurs in all grades of society is more common in girls than in boys, and has been observed in one of homologous twins. The disease has never been seen in a child at the breast. The onset is usually insidious during the age-period of nine months to two years. Associated as that age-period is with dietetic changes and teething it is not to be wondered at that the earliest digestive symptoms of the disorder are usually ascribed to such causes, and it is often only after the bowel disorder and failure to thrive has been present for some time that the correct diagnosis is made or even that medical advice is sought. In the early stages of the disease diagnosis is almost impossible; indeed it is often not made until the complete clinical picture has developed, and thus the cause of the illness frequently remains undiagnosed until the child is five or six years of age. Careful inquiry into the history of such cases will nevertheless often reveal the fact that digestive disturbances have been present for a long time, possibly for years. Occasionally the onset is apparently an abrupt one, and then a few days after the onset of an acute attack of diarrhœa and vomiting the stools are noticed to be large and pale. The characteristics of the fully developed case are: (1) the passage of large, pale, and offensive stools containing considerable amounts of fat; (2) wasting—and stunting of growth amounting to infantilism—chiefly due to absence of stored fat; (3) abdominal distension; (4) anorexia and certain other nervous symptoms; and perhaps (5) the presence of deficiency symptoms.

* An address delivered before the Ulster Medical Society on Nov. 13th, 1930.

CHARACTER OF THE FÆCES.

The fæces furnish the key to the diagnosis of cœliac disease, and there is no better description of them than that contained in Gee's paper: "Signs of the disease are yielded by the fæces, being loose, not formed, but not watery; more bulky than the food taken would seem to account for; pale in colour as if devoid of bile; yeasty, frothy, an appearance probably due to fermentation; stinking, stench often very great. The hue is somewhile more yellow, otherwhile more drab." During the long drawn-out course of cœliac disease there are many ups and downs, and for periods the stool may be quite formed and even coloured but at other times the typical stools so aptly described by Gee are present, although under adequate treatment they are not so frequently seen as in the untreated case. Miller holds the view that certain cases are characterised throughout their whole course by the absence of diarrhœa and speaks of a non-diarrhœal type of cœliac disease, but it would appear that these types only indicate a difference in severity. In the diarrhœal periods more free fatty acid is present in the stool whereas soaps predominate in the more or less formed stools of the non-diarrhœal periods.

The number of stools passed each day varies thus: in the non-diarrhœal phases there may be one or two a day, whereas in the diarrhœal phases two to three is a very common number, although sometimes there may be five or six. The stool is large and when loose contains a high percentage of water, a point which continental writers think of very great importance. Some of the marked vagaries of the patient's weight chart may depend upon the weight of the stools since the total weight of stool passed in 24 hours may be one pound. Not only is there excess of water but on ordinary diet there is always, even in the non-diarrhœal periods, a considerably greater amount of solid matter than in a normal stool and of this a large proportion is fat. Fat should not form more than 25 per cent. of the dried fæces of a child taking an ordinary mixed diet, but in cœliac disease it usually forms from 40 to 60 and may even reach 80 per cent. The estimation of the percentage composition of the fæces is of the greatest importance in arriving at a diagnosis of cœliac disease, but it must always be correlated with the weight of the dried fæces since in all diarrhœal conditions the stool contains more fat than normal. A diagnosis of cœliac disease should not be made if the stool does not contain more than 2 g. of fat per day, but the amount of fat passed daily is usually very much greater than this and may reach 20 g. or even more. It is also advisable to estimate the amount of fat passed over a period of three to five days. In spite of this large proportion of fat in the stool the absorption of fat is often—particularly in the non-diarrhœal periods—surprisingly high. For instance in a child whose dried fæces showed 42·1 per cent. of fat, 83·5 per cent. of the total fat intake was absorbed. The significance of this may perhaps be better understood when it is remembered that the normal child absorbs about 95 and children suffering from biliary atresia an average of 30 per cent. of their fat intake. Further within certain limits an increase in the fat intake produces an increase in fat absorption. This occurs when one case is compared with another and also in the same case, and is probably one of the reasons why occasionally children suffering from

cœliac disease have done well on cod-liver oil. Nevertheless a high or even a normal fat intake usually cannot be maintained for any length of time because an increase in the number, size, and offensiveness of the stools results.

In spite of this steatorrhœa the fat in the stools is well split, and the neutral fat does not form more than 25 per cent. of the total fat, and as a result of the great loss of fat in the stools there is marked demineralisation and in particular a considerable loss of calcium and phosphorus. Nitrogen absorption, on the other hand, by balance experiments appears to be normal.

The frothy appearance of the stool to which Gee refers is probably due to fermentation of carbohydrates.

WASTING.

Wasting, which becomes obvious as the disease develops and often reaches an extreme degree, is largely due to the absence of subcutaneous fat and is particularly noticeable in the gluteal and adductor regions. For some unknown reason the face often remains plump and rounded, and frequently there is quite a degree of colour in the cheeks so that almost a characteristic facies develops. If the child is clothed when first seen the degree of wasting revealed by undressing is indeed astounding, for these children "strip" badly. The wasting of the limbs contrasts markedly with the face as also does the distended abdomen with the atrophied buttocks. Indeed so striking is the latter that Miller has referred to it as the "gluteal sign."

The degree of wasting may perhaps be realised when it is stated that a child of 2 years old may weigh from 14 to 16 lb. instead of a normal 28 lb. The progress of the case shows a weight chart with many ups and downs, the variations being due to some extent to the presence or absence of large amounts of fæcal material in the bowel or to varying degrees of water in the tissues (hydrolability), and thus the net result of many weeks of treatment may only be represented by gain in weight of one or two pounds. The importance of wasting as a symptom may perhaps be emphasised by another quotation from Gee, "To diarrhœa alba add emaciation and cachexia and we have a complete picture of the disease."

Associated with the wasting is a marked degree of muscular hypotonia and a diminution of the rate of growth and physical development, with the result that as the child becomes older it is seen to be stunted, and a child of 9 may appear to be four or five years younger than its actual age. Unless appropriate treatment is instituted, this infantilism becomes more and more marked as the child grows older. The most extreme case in my experience was a girl whose height when 17 years old was no greater than a normal child of 4 years of age, and who had such extreme delay in dentition that none of her permanent teeth had erupted. As a rule dentition is delayed, but not to this extreme degree, and in some cases the enamel is badly formed.

Abdominal distension is another very obvious and characteristic symptom. It is rendered the more striking by the wasting of the gluteal region, and its presence leads frequently to the mistaken diagnosis of tuberculous peritonitis. The distension varies somewhat in degree depending on the state and contents of the bowels, for it has been demonstrated by radiographic examination that this symptom is due to flatulent distension of the intestine, particularly the colon. Hypotonia of the abdominal wall is also a factor in the distension.

NERVOUS SYMPTOMS.

Anorexia may reach an extreme degree, but fortunately on the other hand some of these children will suffer the infliction of protein skimmed milk as their sole dietary for long periods. The appetite is, however, always markedly capricious at some periods of the illness.

The behaviour characteristics of these patients are most interesting. Their intelligence is normal although the education of the older children naturally has suffered; the latter often appear to be rather precocious chiefly because their infantilism causes them to be treated as much younger than their actual age. In their periods of improvement the subjects of cœliac disease are most attractive, although perhaps more easily moved to tears than a normal child and usually somewhat spoilt, but in the diarrhœal period they are irritable and passionate and are as moody and capricious as their appetites; nothing pleases them, and their misery reaches a degree which makes them a trial to those who have charge of them and would lead one to suppose that it could not be the same child which was previously such a fascinating person. "When they are good they are very, very good, but when they are bad they are horrid."

There are not any definite signs of organic nervous disease. Sometimes the limbs are tender—a symptom to which Gee referred to as muscular tenderness—and this has been said to be due to peripheral neuritis. Such a diagnosis receives some support from the fact that the knee-jerks, may be absent, but the probability is that the tenderness is due to scurvy.

A degree of anæmia of the secondary type, probably nutritional in origin, is usually present, and severe anæmia resembling that seen in sprue has been described in one or two cases.

DEFICIENCY SYMPTOMS.

A series of symptoms which are probably the result of vitamin deficiency may now be considered. Scurvy occurs in mild degree, being the result of the restricted dietary. Œdema is not infrequent, and occasionally free fluid can be demonstrated in the abdominal cavity, which adds yet another difficulty to the differentiation of cœliac disease from tuberculous peritonitis. This œdema is very similar to the nutritional or hunger œdema seen in marasmic infants, and it has been suggested that it is an infantile manifestation of beri-beri and due to absence of vitamin B. Recovery from this symptom may occur after adding ripe bananas which are rich in vitamin B to the diet.

It has been suggested that the stunting of growth is itself a "deficiency" symptom and due to deficiency of vitamin A or of a combination of vitamins. The liability to infections, particularly coryzas and the occurrence of parenteral infective diarrhœa, is more probably due to absence of vitamin A, but it is curious that what is usually regarded as the specific lesion of vitamin-A deficiency—xerophthalmia—is rarely seen, although cases have been reported by B. Schick.

The most interesting group of symptoms which call for discussion under this head are those concerned with the bones. Rickets occurs at two definite periods in cœliac disease—namely, in infancy and in the later years of childhood. It may occur at the ordinary age-incidence of rickets—i.e., 6 to 18 months—may heal and then reappear at from 5 to 7 years and reach an extreme degree. I have not observed this sequence in the same case although it has been reported by Lehman, but I have seen rickets at these two

age-periods in different cases. The early rickets differs in no way from ordinary infantile rickets except that the cod-liver oil can rarely be used as a curative agent. The rickets, however, may heal as a result of the presence of cœliac disease, for this produces a partial starvation and arrest of growth, conditions which cure experimental rickets in rats. The bone itself is atrophic and fragile, in fact shows an osteoporosis, and gives a radiogram which to anyone who is familiar with the picture would itself suggest that the underlying condition was cœliac disease. Tracing chronologically then the order of events we may see: first, in infancy an osteoporotic bone with rickets; secondly, as the cœliac disease asserts itself more strongly, and stops growth, a stage occurs in which there is a fragile osteoporotic bone but no rickets, and if the cœliac disease has been present for two or three years there are frequently transverse lines in the metaphysis which indicate periods of complete arrest of growth; thirdly, at the age of 5 to 7 when growth is more rapid the bone is still osteoporotic and fragile, but rickets asserts itself again. As mentioned above, it is only rarely that all these stages are seen in the same child, usually the second and third stage only are seen; moreover, the occurrence of the third stage in any case indicates that treatment has been faulty.

The proof that these later bone changes are rachitic is based on (*a*) radiographic appearance, (*b*) blood chemistry, and (*c*) the results of treatment. The radiographic appearances are those of rickets, the blood shows low values for calcium and phosphorus, and treatment by ultra-violet irradiation or non-fatty preparations of vitamin D—e.g., irradiated ergosterol in solid form, cures the rickets and produces a normal blood chemistry. The underlying cause of the bone changes is deficient absorption of calcium and phosphorus, the result of non-absorption of fats and the fat-soluble vitamin D. Such a deficiency in fat-soluble vitamin D is obviously not improved by giving a "fat free" diet.

The activating cause of the rickets is, however, growth; as long as growth does not occur the child is able to supply sufficient calcium and phosphorus to calcify the rarefied bone, but when growth occurs and new bone has to be formed rapidly normal calcification becomes impossible. The usual manifestations of rickets are genu valgum and some enlargement of the epiphyses of the wrist, but the most intense degree of rickets may occur, so that the child shows multiple deformities, rosary, enlarged epiphyses, natiform skull, and multiple fractures of the long bones, and becomes quite unable to stand or walk.

The occurrence of late rickets in cœliac disease has been denied by W. McKim Marriott and others, but in Birmingham it is not infrequently seen. Further, the realisation of the possibility of its development during the rigid dieting which forms such an essential part in the treatment of cœliac disease is of the greatest importance, since appropriate preventive measures can then be instituted.

Another deficiency symptom that occurs from time to time in cœliac disease and which also depends on the presence of low blood calcium is manifest tetany. Donald Hunter has described a case of osteopathic steatorrhœa with tetany and dwarfism in a woman of 34 years of age who had intestinal symptoms and tetany from childhood, and which appears to be an example of cœliac disease persisting in adult life. This patient showed collections of opacities in the lens similar to those seen in post-operative tetany. Slit-lamp examination of several children with cœliac disease has, however, not revealed any opacities of the lens.

It is curious that whereas rickets is comparatively frequent in cœliac disease yet xerophthalmia is so rarely met with, and there is no adequate explanation of why these children can stand deficiency in vitamin A so much better than deficient absorption of vitamin D.

Prognosis.

Cœliac disease runs a long drawn-out course marked by many ups and downs. Even without any treatment it is possible for the patient to survive as a stunted feeble individual, since improvement usually occurs at puberty. Not infrequently, however, the child succumbs before that period from some intercurrent infection, although death from uncomplicated cœliac disease is relatively rare. Moreover, in spite of careful treatment, progress towards recovery is slow and intermittent and diarrhœa occurs from time to time, possibly from irregularities and premature changes in the diet, or from parenteral infections, but if treatment is carried out efficiently a cure can usually be promised. The length of time required to effect a cure varies in different individuals, even although the disease may appear to be of similar severity when treatment is started. In many cases in which recovery appears to have taken place the stools show rather more fat than the normal, whereas in others a complete clinical and "biochemical" recovery occurs. In some instances after puberty is established both "biochemical" and clinical recovery rapidly occur.

Increase in weight and height are good tests of the improvement of a case, but any definite retardation of growth always leaves its mark, and, although after recovery growth may be considerable, the child never reaches normal height. Fat is deposited in the subcutaneous tissues, and in some children for a few years after cure is complete the distribution of fat is very like that seen in mild examples of Fröhlich's syndrome, and the weight for height proportion is greater than in the normal child. The disease rarely persists into adult life, but the case reported by Hunter, and to which I have already referred, appears to be beyond criticism.

In arriving at the present-day conception of cœliac disease there have been four important landmarks. First, the stress laid by Gee on the intestinal symptoms—the diarrhœa alba; secondly, the insistence by Herter on infantilism as an outstanding symptom; thirdly, the success of a protein dietary in treatment; fourthly, the recognition of the presence of many symptoms of a deficiency disorder—e.g., tetany, scurvy, rickets, œdema.

Morbid Anatomy and Causation.

There is no known morbid anatomy of the disease and its cause is quite unknown. Post-mortem examinations are somewhat rare, and any abnormal appearances that have been observed in the course of such examinations are either due to secondary infections or to the result of malnutrition. There is no evidence of enteritis, a fact which disposes both of the theory that the disease is allied to sprue, as first suggested by Gee, and also of the view that it is a special form of chronic enteritis.

In chronic enteritis the stools do not have the characteristics of cœliac disease, and although there is an increased loss of fat in diarrhœa this loss is not so great as in cœliac disease in which, as a matter of

fact, diarrhœa is not so characteristic a feature of the disorder as the passage of two to three large loose stools in the 24 hours.

Some cases of tuberculous disease of the mesenteric lymphatics show a definite steatorrhœa, and Ryle has made the suggestion that cœliac disease may be due to obstruction of the lacteals by tuberculous disease. This suggestion is not borne out by post-mortem examinations, and in a fatal case which Neale and I reported it was found possible to inject the lacteals and lymphatic vessels with methylene-blue, thereby demonstrating their patency.

As might have been expected, attempts to explain the disease on bacteriological grounds have not been lacking. Herter, in his monograph, drew attention to the fact that as long as the infant has not taken any diet except milk the organisms in the stool are all Gram-positive, but that once a mixed diet has been taken the bacterial character of the stool changes and the predominant organisms show Gram-negative characters. In children suffering from cœliac disease he found that the predominant organisms in the stools were Gram-positive, or in other words there was a persistence of the infantile type of intestinal flora. Whilst it is true that such organisms may be present in considerable numbers his suggestion has not been accepted, although Alan Brown, A. M. Courtney, G. A. Davis, and I. F. McLachlan, of Toronto, have published similar observations.

Others have suggested that cœliac disease occurs as the result of chronic infection with organisms of the dysentery group, particularly the Shiga and Flexner types. The arguments already used against the disease being the result of chronic enteritis also obtain in this connexion; further, the onset of cœliac disease is usually insidious and does not follow an attack of acute diarrhœa, although it is true that occasionally such organisms have been isolated from the stools or positive agglutinations have been obtained. Positive agglutinations are sometimes found in the blood of children who are not suffering from any obvious intestinal disease but these results are so difficult of explanation that they cannot be accepted as evidence of cause and effect.

Finally the suggestion has been made that cœliac disease is a deficiency disorder. In certain experiments carried out by R. McCarrison, monkeys fed on a diet deficient in vitamins, but containing an excess of carbohydrates and fats, developed steatorrhœa and a general appearance very like cœliac disease. Whether this be the true explanation of the change in alimentary function cannot be stated, but there is very little doubt that many of the symptoms are the consequence of avitaminosis resulting from defective alimentary absorption.

The characteristic feature of the disease is the presence of steatorrhœa, and it was the appearance of the stools which made Gee and others suggest that cœliac disease was non-tropical sprue. If the cause of cœliac steatorrhœa could be determined we should know the cause of cœliac disease. The suggestion has been made that there is an absence of bile in the intestines and hence the name acholia, but in the examination of a large number of cases of cœliac disease we have never been able to demonstrate the absence of bile-pigment or salts in the stools. Achlorhydria has been reported on several occasions, but a series of observations by A. V. Neale on gastric and pancreatic juice and bile obtained by gastric and duodenal intubation showed that although sometimes achlorhydria was found, there was no instance of achylia gastrica, since free hydrochloric acid could always be obtained by histamine. In every instance the digestive enzymes were present in normal amounts in the gastric and pancreatic juice and composition of the bile appeared to be normal.

A METABOLIC DISORDER?

From the results which I have already put before you it would seem that the fault in cœliac disease is not one of digestion but of absorption, and that the excess of fat in the stool is chiefly derived from unabsorbed food fat. The suggestion has, however, been made that cœliac disease is a metabolic disorder, similar to diabetes, and that the fat is an excretion from the blood. The possibility that a small amount of fæcal fat is secreted from the blood cannot be denied, because, in the lowest fat content food that we have been able to devise, the stool, in both normal children and in those suffering from cœliac disease, has contained fat in amounts ranging from 0·3 to 1·0 g. in the 24 hours. Further, in one case of cœliac disease over an observation period of six days, the daily output of fat was 1·2 g., whereas the daily intake was only 1·0 g.

If this suggestion be correct, then in children suffering from cœliac disease: first, the composition of the fat in the fæces should be fairly constant and not vary with the composition of the fat in the food; secondly, the blood fat should be higher than in normal children. Now it is extremely difficult to prove conclusively that fæcal fat is or is not unabsorbed food fat, but by feeding fats having differing iodine values for periods of five days at a time fæcal fat has been obtained, the iodine values of which, although not identical with those of the food fat, do show similar variations; results which appear to warrant the conclusion that fæcal fat is largely unabsorbed food fat.

A. A. Moncrieff and W. W. Payne have reported that in six cases of cœliac disease they found a high blood fat, but there are many fallacies about blood fat estimation which have to be considered before any definite statements can be made or accepted. For instance, it is extremely difficult to get a constant value for blood fat because in a fasting individual any exercise mobilises fat and therefore raises the value. Again, from observations carried out on human beings by C. W. McClure and M. Huntsinger it would appear that the increase in the fatty acid concentration of the blood which occurs after the ingestion of oleic acid is not solely due to an increase in oleic acid but that it is in part due to mobilisation of fat either from the liver or adipose tissues, and further, that such mobilisation occurs after a meal of any variety of food (fat, protein, or carbohydrate). However, if blood fat is estimated whilst resting after a night fast the results obtained are constant for the same individual (J. W. Patterson). Under such conditions the average of 31 normal children was 0·614 g. of fatty acid per cent. compared with an average of 0·480 g. per cent. for 12 children suffering from cœliac disease. These results show that on the whole blood fat in cœliac disease has a lower and not a higher value than that found in normal children. A series of blood-fat estimations after the administration of (*a*) 60 g. of olive oil and another series after giving (*b*) 15 g. of glucose dissolved in 120 c.cm. of water were carried out in children suffering from cœliac disease, and in normal children over a period of three and a half hours to four hours. These curves show that in cœliac disease the blood fat curve is set at a low level (hypolipæmia) and that fat is mobilised less readily than in the normal controls.

An interesting parallel to this hypolipæmic curve is the hypoglycæmic curve obtained after the ingestion

of glucose. The blood-sugar curve, however, becomes normal when adrenalin is administered, due to the fact that sugar is mobilised. Fat, on the other hand, probably cannot be mobilised from the fat depôts because there is not sufficient depôt fat to meet the demand. The opposite state of affairs is said to occur in diabetes—namely, that a hyperlipæmic curve occurs similar in characteristics to the hyperglycæmic curve—i.e., a quick rise to a level higher than normal and a delayed return to the fasting level.

We have, therefore, not found any evidence to support the view that the increased fæcal fat in cœliac disease is due to increased excretion of blood fat, and the most probable explanation of the low fat (hypolipæmic) curve, and incidentally the low sugar (hypoglycæmic) curve also, is that it is due to defective absorption from the intestine.

When, however, we ask the why and wherefore of this faulty absorption, no answer is at present forthcoming. Remembering the results of the foregoing investigations, the absence of morbid findings, and the fact that the disorder may spontaneously cure, it seems logical to assume that the defect belongs to the group of so-called "functional" disorders. A recent paper by J. A. Gardner and H. Gainsborough[1] contains some interesting facts which may possibly be of considerable importance in cœliac disease. Deoxycholic acid, one of the bile acids, occurs free in bile or in combination with glycine or taurine, and according to H. Wieland and H. Sorge forms stable molecular compounds with the higher fatty acids; further, the choleic acids isolated from bile are a mixture of such stearic, palmitic, and oleic acid compounds, the sodium salts of which are soluble in water. This power of uniting with insoluble substances to form soluble products was called by Wieland "the choleic acid principle" and he concluded that deoxycholic acid had an important function in transporting insoluble substances such as fat and fatty acid through the intestinal wall. Gardner and Gainsborough believe that this "choleic acid principle" provides a more satisfactory explanation of intestinal fat absorption than either the theory of particulate absorption or that of the absorption of fats in the form of soluble soaps. Although the bile and stools in cases of cœliac disease have given normal reactions for bile salts and pigments the available means of estimating bile acids are indirect and afford no information as to the relative distribution of the different acids, and we are now attempting to compare the diffusion rates of a mixture of oleic acid and bile from cases of cœliac disease with a mixture of oleic acid and bile from normal children, but a sufficient number of observations have not yet been made to justify any statement.

Treatment.

The secret of successful treatment is meticulous care in the application of the facts which have been detailed. The essentials in the dietetic treatment are to give a high protein diet with only a moderate amount of carbohydrate and a very low or absent fat content, and an adequate supply of vitamins, salts, and water. The method which we have found best to fulfil these essentials is a three phase diet similar to that introduced and practised with such considerable success by John Howland. The first phase is to give a protein skimmed milk. This is made by using a good dried skimmed milk powder, to which is added powdered casein in the form of Casec (Mead Johnson and Co.) in the proportion of grs. 20 to each ounce of reconstituted milk. This may be sweetened if necessary by the addition of gr. ¼ of saccharine. The second phase consists in the addition of bovril—or other form of beef juice from which the fat has been removed—and other varieties of protein, such as egg albumin, small quantities of rabbit, or breast of chicken. In the third phase the amount of protein is increased, and small amounts of carbohydrates are added, such as ripe banana, zwieback, grape nuts, and potato crisps without fat. The final stages in treatment are the addition of well-cooked cereals such as rice and arrowroot and small amounts of fat.

All dietetic modifications call for the greatest watchfulness, and care should be exercised to note any slackening in gain of weight, any increase in abdominal distension, in the frequency and offensiveness of stools, the occurrence of pyrexia, irritability, &c. This care applies in particular to any addition of fat to the diet, since some of these children react to fat so rapidly as to suggest an allergic reaction. In any case it is probably unwise to return to whole milk for a period of a year after commencing treatment, but cases vary so much that it is impossible to lay down rigid time intervals. Some children seem to thrive better if allowed small amounts of fat, a fact which has induced Miller to write "It is unwise to treat the stools and not the patient." Incidentally, it is almost impossible to frame a diet that is fat-free, and so-called lean meat usually contains a considerable amount of fat. Tongue which has been recommended as a source of fat-free protein contains fat in quite appreciable amounts. As far as our experience goes the meat which presents the nearest approach to being free from fat is rabbit and second to it is breast of chicken.

At all times during treatment the first phase diet should be resumed if there is any recurrence of any untoward symptoms. The addition of many forms of carbohydrate increases the frequency of the stools, but this is less likely to occur if the carbohydrate is given as grape nuts, or thoroughly toasted almost caramelised bread, such as zwieback, or thin slices of potato treated in the same way. Many people now make use of the pulp of ripe bananas. The banana must, however, be fully ripened, in which condition the skin is brown and thin and strips with great ease. The chemical composition of banana pulp is as follows: fat, nil; protein, less than 1 per cent.; ash, 1 per cent.; carbohydrate, 20 per cent.; and when thoroughly ripe all the carbohydrate is in the form of glucose. Iron, phosphorus, calcium, magnesium, and the vitamins A, B, and C, are also present so that in theory it is a highly valuable foodstuff. In practice also it is found useful in many cases, but in others leads to increased frequency in the number of the stools, which possibly is sometimes due to the difficulty in obtaining the fully ripened fruit. With regard to vitamins it is our custom to give marmite to supply vitamin B, and it is essential to supply vitamin D either by ultra-violet irradiation or by giving in dry form irradiated ergosterol. Such treatment will prevent the development of rickets, but if rickets has already developed before the case comes under treatment a complete cure can be obtained by giving larger doses of irradiated ergosterol or by ultra-violet irradiation. The cure of "cœliac rickets" often requires treatment for a much longer period of time than does the cure of infantile rickets, but it is astounding how fractures heal and how in time many of the deformities, including such marked ones as extremely severe genu valgum, greatly improve. I have not tried any special way of giving vitamin A,

[1] Quart. Jour. Med., 1930, xxxiii., 465.

but administration of carotene, a body closely related to vitamin A, is well worth a trial.

As to other forms of treatment rest in bed is of great importance in the early stages of the disease, and at any time if the disease is severe or if rickets is present. Care should be taken to prevent parenteral infections, and if the diarrhœa is severe periodic blood transfusions are of the greatest value and may prove the turning-point in a severe case. Gentle massage to the limbs is helpful, particularly during the period of confinement to bed. For the secondary anæmia liver extract may be tried, but the drug most likely to prove helpful is ferrum redactum in one-grain doses which, incidentally, is chiefly of value because of the copper present in it as an impurity. Other drugs are of little or no value in cœliac disease, and the administration of pancreatic extracts is based on an incorrect conception of the disease.

The treatment of cœliac disease is very tedious and often anxious, yet withal fascinating, because, by perseverance along the lines suggested, a complete invalid can be transformed into a useful member of child society, and at times even the bed-ridden can be made to "take up his bed and walk." Such success can, however, never be obtained without intelligent coöperation on the part of the parents and the expenditure of much care, thought, and anxiety on the part of both doctor and parents.

The original investigations to which reference has been made in this address have been carried out jointly with my colleagues, Dr. A. V. Neale and Dr. E. M. Hickmans, to whom, as well as the Medical Research Council, who have defrayed the expenses incurred, I am greatly indebted.

SOME CLINICAL CONDITIONS ASSOCIATED WITH ACHLORHYDRIA.*

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THE association of achlorhydria with pernicious anæmia and subacute combined degeneration of the spinal cord is well recognised, but its presence in other conditions is not so widely appreciated. In infectious diseases its occurrence has been observed by many workers. Thus Van den Velden and Thaysen and Wegge noted it in typhoid fever; Frankl and Plaschkes found 25 per cent. with achlorhydria and 50 per cent. with hypochlorhydria after typhus, whilst of paratyphoid cases 50 per cent. had achlorhydria and 35 per cent. hypochlorhydria. Tørning has seen achylia gastrica in 6 per cent. and hypo-acidity in 9 per cent. of 150 pulmonary tuberculous patients, whilst Permin showed that achlorhydria became more common as the disease progressed and was present in 75 per cent. of the advanced cases; similar observations have been made by Faber (1905) and by Faber and Lange and others. In malarial patients 26 per cent. have been shown to have an achlorhydria that frequently persisted throughout life (Guido). Achylia gastrica was also commonly found by Bloch after acute infections, such as influenza, pneumonia, and enteritis. The occurrence of achlorhydria or achylia gastrica after a variety of toxic or irritant factors has been discussed by workers in this country, notably Hurst, and in other countries by Faber and Lange, Faber (1920), Martius, Weinberg, Martinez, and many others.

Whether achlorhydria is congenital or acquired is a matter still in dispute. Martius noticed that a large proportion of young children had reduced gastric acidity, and considered this as evidence for a congenital occurrence. Jacobsen, however, found that many children with gastric symptoms did not show any pronounced tendency to achlorhydria, although it did occur amongst those with acute intestinal affections. Treatment and examination after recovery showed that some recovered normal gastric function while others did not. Similar results were obtained by Hertz, Chievitz, and Klementsohn. From an examination of normal infants, Marriott and Davidson, Babbott and others, and Davison, amongst others, found that gastric samples withdrawn at the height of digestion usually showed values of pH 3·0–pH 5·0, few cases falling below pH 3·0, but there was an increased acid-production with increased age. Since the healthy adult's gastric juice is approximately pH 1·2–1·4 (60–40 units of n/10 alkali), it will be seen to be of the order of a hundredfold to thousandsfold more acidic than was found in these normal infants.

It is possible that the gastric juice of such infants is not fully developed until later. This would be in harmony with the suggestion of Bauer that the persistence of the infantile glandular state means the under-development of the acid-secreting elements. The ease with which the gastric juice is influenced in infants by slight malaise or disease makes it difficult to interpret such results, as suggested by Faber.

Martius considered that chronic achylia gastrica was due to a congenital constitutional abnormality and was not secondary to a gastric atrophy, as put forward by Einhorn (1892). Faber (1920), however, thinks that it is due to a chronic gastritis of exogenous cause; whilst Schmidt believes that anomalies of innervation of the stomach will explain the dysfunction. Albu has explained it on the grounds of a congenital functional debility of the mucosa, but Disqué suggests a neurogenic factor leading to a functional depression of the mucosa.

It has been observed by several workers that the frequency of achlorhydria or hypo-acidity increases with age, and a variety of causes have been suggested —e.g., toxins, irritants, senile atrophy, and gross abuse of the stomach, as by insufficient mastication of the food, alcohol, &c. In this connexion, Seidélin found that 40 per cent. of working-class patients over 50 years of age and 67 per cent. over 67 years of age had absent or diminished secretion, whilst Dedichen observed anacidity in 66 per cent. of 99 healthy old people of 67 to 92 years of age. Keefer and Bloomfield, Faber (1927), and Gilford, have made similar observations whilst, on the other hand, Bell considers that hyperchlorhydria is also more common over 40 years of age. Vogelius found that cases of alcoholic gastritis with free acid in the gastric secretion showed achylia a few years later. Over 50 per cent. of these cases had gastritis, and improved in the early stages with treatment and abstinence from alcohol.

More recently, attention has been redirected by Langdon Brown to the importance of this association of achlorhydria with a variety of diseases. While Hurst (1929) has made similar observations and regards it as an ætiological factor in gastric carcinoma, Ley has observed achylia in patients over periods of many years and not noticed the development of cancer.

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Again, asthmatic patients frequently show a diminished or absent hydrochloric acid secretion, as recently emphasised by Bray, whilst the treatment of hay-fever with nitro-hydrochloric acid has been tried by Beckman for some years.

During the past two years we have been investigating certain types of cases in which the clinical condition has suggested an impairment of the gastric secretion. We have examined 100 cases by means of the fractional test-meal and have found a surprisingly large percentage with achylia gastrica or hypo-acidity. These may be considered conveniently in the following five groups :—

Gastrogenous Diarrhœa.

Group 1.—It has been known for a long time that a certain type of diarrhœa appears to bear some relationship to a deficient gastric acidity. This is the "gastrogenous diarrhœa" originally described by Einhorn (1898). Udaondo has cited a case in which a parent and two children, suffering from chronic diarrhœa, had achylia. More recently, Martinez has reported that he has seen two families with chronic diarrhœa associated with very marked nervous symptoms. In the first, a mother and four children had chronic diarrhœa and gastro-intestinal disturbances associated with achlorhydria, while five out of the 13 grandchildren also had achlorhydria. In the second family a mother and three daughters had chronic gastro-intestinal disturbances, together with achlorhydria. In both families there was an associated hysterical and very nervous temperament.

Studying 50 cases of mucous colitis, Bockus, Bank, and Wilkinson found 11 with hypo-acidity and two with achlorhydria; 32 of these cases were females. In a review of 425 consecutive cases of fractional gastric analysis Bell found 11 cases of chronic colitis (two with hypochlorhydria but none with achlorhydria) and 4 cases of diarrhœa (one with achlorhydria only). A similar statistical survey of 912 cases of an acidity or hypo-acidity by Hartman and Sager disclosed very few cases of chronic diarrhœa; there were 49 cases of achlorhydria without any symptoms or other diagnosis, whilst 245 were classed as functional nervous disease and presumably would include some cases of gastrogenous diarrhœa. Recently, Spriggs has reported that in 111 cases of functional disorders of the colon the gastric juice was super-acid in 41 per cent., sub-acid in 23 per cent., achlorhydric in 2 per cent. It is, of course, well known that colitis and progressive gastric hypo-acidity occur in sprue, while one of us (J. F. W.) has recently seen chronic diarrhœa and achylia in a pellagrin.

We ourselves have observed the remarkable regularity with which a persistent or recurrent diarrhœa existing over long periods has been associated with a deficient gastric secretion. This type of gastrogenous diarrhœa often appears to benefit by the exhibition of small doses (℥ v.–xv.) of hydrochloric acid (cf. Hurst (1929), Hunter, and Kantor and Sagal). Of greater importance, however, is the fact that there appears to be a very definite clinical picture associated with this "gastrogenous" diarrhœa, so much so that but rarely have we found the results of a fractional test-meal to be at variance with what we had suspected at the bedside. The recognition of this achlorhydric syndrome is of great practical importance as, in many instances, the simple remedy of giving adequate doses of dilute hydrochloric acid (℥ xxx.–lx.) leads to very striking therapeutic results.

In our first group of 53 cases the symptoms are mainly gastro-intestinal, the patient complaining of colicky pains, flatulence, and diarrhœa. This last symptom varies considerably in its severity; it may be intermittent and is sometimes only disclosed by questioning the patient. It is rarely sufficient to incapacitate, although occasionally there may be a history of blood or mucus in the stools. The history is usually a long one (3–20 years), while not infrequently a family history of looseness of the bowels may be obtained. One family in our series is worthy of especial mention in this respect. A man, invalided from the army in 1857 for persistent diarrhœa, his two daughters, a granddaughter, and a great-granddaughter all suffered from this condition. We were able to examine three members of the family, representing three generations, and in all of them we found achlorhydria.

○ = Chronic diarrhœa, gastric analysis not made.
● = Achylia associated with chronic diarrhœa.

Apart from the gastro-intestinal symptoms, these patients may complain of a lack of vitality and depression, and, as they are often highly neurotic, a diagnosis of nervous dyspepsia may be made. In some of the cases an intermittent soreness of the tongue may be complained of, and this may be a valuable guide in establishing the diagnosis.

The physical signs are few. There may be a slight secondary anæmia, and on abdominal examination the liver may be slightly enlarged, while tenderness can be elicited by deep palpation over the descending colon, and succussion sounds are common. The following is typical of the cases we are describing :—

A clerk, aged 36, consulted us complaining of an indigestion of many years' standing. He suffered from colicky pains across the abdomen and extreme flatulence, and gave a history of intermittent diarrhœa. During the war he was gassed and the diarrhœa was very severe; it has recurred from time to time since then. For two months before he was examined the diarrhœa had ceased, but the motions were irregular, the bowels usually being opened twice a day. There had never been any blood or mucus in the stool. He said that he was always tired, did not feel fit for his work, and that his ankles swelled at night. On questioning, he said that he had had occasional ulceration of his mouth during the past ten years.

On examination, he was pasty and unhealthy looking, the abdominal wall was flabby, and there was much splashing and gurgling on palpation. The liver could be felt about one inch from the costal margin. There were no other physical signs to be made out, and the only positive result obtained from clinical investigations was the gastric analysis, which showed complete achlorhydria.

He was given ℥ xxx. of acid. hydrochlor. dil. (B.P.) and pepsin, three times a day after meals, and immediately improved. A year later he reported himself to be very well; he had gained 1½ st. in weight and no longer suffered from gastro-intestinal symptoms.

Although in the majority of cases there is no danger to life, occasionally the achlorhydria may be associated with a much more serious condition and is probably the precursor of it. In one case, which has already been recorded (Susman and Oliver), an acute yellow atrophy of the liver followed the intense enteritis that had developed. In another case diabetes developed in a patient who gave a long history of gastro-intestinal symptoms associated with diarrhœa; in another the patient developed exophthalmic goitre.

It should be remembered that occasionally one meets a case presenting the typical clinical picture of the "achlorhydric syndrome" in which a gastric

test-meal discloses a hyperacidic condition rather than the anticipated hypo-acidity. Libert mentions the possibility of hyperacidity in this connexion. We have found one in a series of 53 cases examined. The treatment of such a case with hydrochloric acid is contra-indicated, since alkalis usually relieve the condition, and it is, therefore, a sine qua non that the diagnosis of an "achlorhydric syndrome" necessitates a gastric investigation. We have also noted the frequent history of an operative interference for appendicitis or gastric ulcer in cases subsequently shown to have the typical achlorhydric syndrome on presenting themselves with recurrences of the original symptoms. A similar observation has been made by Levine and Ladd in six of 125 cases of pernicious anæmia. The possibility of abnormal radiographic results in gastric achylia should also be borne in mind (Hines).

Table I. summarises the findings in our series of 53 cases in which gastro-intestinal symptoms were the predominant feature.

TABLE I.

	Male.	Female.	Total.
Achylia gastrica	5	20	25
Hypochlorhydria—			
(*a*) Peptic activity negligible	2	6	8
(*b*) Peptic activity normal	5	5	10
Normal hydrochloric acid—			
(*a*) Peptic activity diminished	0	1	1
(*b*) Peptic activity normal	0	8	8
Hyperchlorhydria	0	1	1
	12	41	53

All the cases were examined by means of a fractional test-meal and the titres for free hydrochloric acid, total acidity, total chlorides, and peptic activity were determined for each sample. The 25 cases with achlorhydria also showed either complete or almost complete absence of peptic activity in all samples —i.e., achylia gastrica. This was confirmed in several cases which were re-examined after varying intervals. The remainder of the cases fell into very definite groups, as shown in Table I.; the highest value obtained in the hypochlorhydric group being 16 units (0·058 per cent.) of hydrochloric acid, while the lowest of the maximum titres in the normal group was 28 units (0·102 per cent.). One case showed hyperchlorhydria (over 70 units of free acid).

TREATMENT.

In the treatment of chronic diarrhœa a great variety of drugs have been tried. The gastric secretory deficiency suggests the use of hydrochloric acid, and small doses (♏ v.–xv.) have been tried by many authors, notably Hunter, Kantor and Sagal, Schneyer, and Martinez. The question of an adequate dose is important. It was shown, as long ago as 1908, by Fischer and by Leo that there was a minimum dose of dilute hydrochloric acid (2·75 c.cm. of 10 per cent. acid) that would produce free acid in the gastric contents, while greater doses (13 c.cm.) often failed to produce free acid. Crohn showed that small single doses of hydrochloric acid, U.S.P. dil. (11·5 per cent.), were neutralised when given to achlorhydric patients and that at least 1·6 to 2·6 c.cm. were required to render the gastric contents acid. Similar observations have been made by Vanderhoof, Hurst, Shaw, and by Kearn, Rose, and Austin, who advocate 4·8 c.cm. of the diluted acid.

As will be seen from our results of gastric investigations above, there is usually a deficiency in pepsin in the gastric juices of achlorhydric patients, and it has been observed by Wilkinson and Brockbank that in cases of pernicious anæmia with gastro-intestinal symptoms these latter are relieved by the use of pepsin together with the acid. We have, therefore, been using this mixture containing acid. hydrochlor. dil. (B.P.), ½–1 drachm, and glycerinum pepsini, 1–1½ drachms, well diluted with water three or four times a day with meals. In all cases, the gastric symptoms due to the achlorhydria have been cured as long as the treatment was continued.

RESULTS AND TREATMENT.

The 43 cases in this group with achylia or hypochlorhydria, and the normal case with diminished peptic activity, were given the above treatment.

(1) Twenty-eight have received treatment for periods of six months to two years and show the following results. Seventeen of the 18 cases with achylia were promptly relieved by the treatment; 16 of them are very well and have been free from gastro-intestinal symptoms (although one occasionally passes some mucus); one improved for eight months, when she developed a subacute atrophy of the liver (Susman and Oliver). The other has improved and is better than before treatment. One case discontinued the acid therapy and relapsed, but is now well again after returning to the treatment.

Of the 10 cases of hypo-acidity, seven are quite well; one still passes some mucus, but is quite well otherwise; and one has very occasional attacks of diarrhœa, which is more marked if she discontinues the acid therapy; one is not improved.

The one case with normal acid secretion but reduced peptic activity has been perfectly well since she commenced this treatment.

The remainder of the cases (eight with normal acidities and one with hyperacidity) were not given the pepsin and hydrochloric acid treatment; of these two are better, two are improved but get occasional attacks of diarrhœa; two are still getting colicky pains; one is slightly better; and two are no better.

(2) The remaining 15 cases (seven with achlorhydria and eight with hypo-acidity) have only received treatment for periods of less than three months and the results have therefore not been included in the above figures. All, however, are showing a satisfactory response at the present time.

Sore Tongues.

Group 2.—In the course of our investigation we very early observed that, while most of our cases complained of such gastro-intestinal disturbances as have already been described, a few gave histories of recurrent sore tongues or of ulcers on the lips and gums. This led us to extend the scope of our work, and we have been able to collect a further group of cases in which the prominent feature is a glossitis or stomatitis with or without a concomitant diarrhœa. Often there is only a glossitis with atrophy of the papillæ, but there may be active ulceration of the tongue, buccal mucous membrane, or soft palate. Usually the ulceration is intermittent, but it may be so severe as to make the patient's life almost unbearable; on the other hand, in one instance there had been a persistent ulceration of the mouth for more than ten years, which had at times been associated with a dermatitis herpetiformis. In nearly all these cases there was either a complete achlorhydria or a marked hypochlorhydria, and in many of them the administration of acid improved the condition. Treatment in this group, however, may be unsatisfactory as, owing to the soreness of the mouth, it is difficult to persuade the patient to persist with the medicine in adequate doses. In this group, also, we were able to carry out fractional test-meals on every case—in some cases repeated at varying intervals with similar results.

Here again, as in Group 1, the 25 cases fell naturally into the arbitrary groups of achylia (9), hypochlorhydria (6), normal acidities (7), and hyperacidity (3). Table II. summarises the findings:—

TABLE II.*

	Male.	Female.	Total.
Achylia gastrica	1	8	9
Hypochlorhydria—			
(*a*) Peptic activity negligible	1	4	5
(*b*) Peptic activity normal	0	1	1
Normal—			
(*a*) Peptic activity negligible	0	4	4
(*b*) Peptic activity normal	0	3	3
Hyperacidity	0	3	3
	2	23	25

* Two cases in Group 1 also complained of sore tongues or ulcers in the mouth, &c.; these are not included in this Table.

Nineteen cases in this group were given the pepsin-hydrochloric acid mixtures.

(1) After periods varying from 4 to 18 months the results were as follows: six patients with achylia gastrica have remained quite well on the treatment; of five showing hypochlorhydria, four are also quite well but the fifth discontinued treatment and now complains of a sore tongue with flatulent dyspepsia. Of two cases with normal acidity but diminished peptic activity, one is no better and the other has had considerable relief from the glossitis but the arthritis is unchanged; the three with hyperacidity were not given the acid therapy.

(2) The nine remaining cases have had less than three months' treatment, but three with achylia and one with hypo-acidity are responding favourably.

These results should be contrasted with those obtained by Sellei, who distinguishes cases with burning and smarting tongues without visible lesions from the actual glossitis we are describing here, and found moderate degrees of hyperacidity to be common. He treated such cases with dilute alkaline mouth washes and administered alkaline mixtures, with or without atropine, finding that prolonged treatment was necessary.

Dermatoses.

Group 3.—Five cases recorded above, three in Group 1. and two in Group 2, had also concomitant skin affections; a sixth case complained of urticaria and angioneurotic œdema. Three complained of recurrent gastro-intestinal disturbances with urticaria, whilst two had persistent ulceration of the mouth associated with a recurrent dermatitis herpetiformis in one case and urticaria in the other. Fractional gastric analysis demonstrated an achylia gastrica in four cases, hypo-acidity in one case, and hyper-acidity in one case. Four cases of urticaria have had no further attacks after 6 to 18 months and in the case with dermatitis herpetiformis some improvement has resulted, but treatment has not been sufficiently lengthy as yet to estimate the final result. The patient with angioneurotic œdema and urticaria has only recently been put on to this treatment.

This association with a skin affection is of interest, since one of us (see Wilkinson and Brockbank) has observed two cases, one of pernicious anæmia, in which an urticarial rash was produced by the liver diet (both fresh liver and liver extracts) but was prevented by the use of hydrochloric acid; the other was a case of symptomless achlorhydria which developed a rash while on acid therapy but was relieved when the acid was discontinued. The association of achlorhydria with many of the dermatoses is not unknown, for Ryle and Barber showed that in 12 cases of acne rosacea five had achlorhydria and two hypo-acidity, and promising results were obtained with acid therapy. Similar results have been obtained by W. H. Brown, who examined 50 cases of rosacea and 50 other dermatoses. He found seven with achlorhydria and eight with hypochlorhydria in the first group, and six and five respectively in the second group. Rulison, in a further group of 50 cases of rosacea, found a corresponding proportion of achlorhydric cases. He also noted the frequent association of functional abnormalities, such as neurotic tendencies, subnormal weight, poor muscular tone, visceroptosis, but constipation rather than diarrhœa. Stein has referred to similar findings.

Rheumatoid Arthritis.

Group 4.—The occurrence of rheumatoid arthritis in association with gastric anacidity has been noted several times. Faber (1913) found achylia gastrica in 15 out of 65 patients with chronic polyarthritis. Borries showed that 30 per cent. of 94 cases had achylia by the Ewald one-hour test-meal, whilst Woodwark and Wallis obtained similar results in 10 cases. Coates and Gordon, also using the Ewald test breakfast, obtained achlorhydria in 14 out of 20 cases of rheumatoid arthritis. Using the fractional method of gastric analysis, Bell found three cases of achlorhydria and one of hypochlorhydria in eight cases, but this was not confirmed by Douthwaite and others. Miller and Smith, from a study of 250 cases, came to the conclusion that achlorhydria and hypochlorhydria in chronic arthritis is five times as great as in normal subjects, but only slightly greater than in other diseases. In 420 collected cases of hypo-acidity, Sager and Hartman only found eight cases of arthritis, but this is a misleading figure since there were probably many cases not investigated for gastric acidity. On the other hand, Lottrup recently described a series of cases of chronic progressive primary polyarthritis in which 44 per cent. had achylia gastrica while 58 per cent. had a simple anæmia; this was in contradistinction to other forms of arthritis in which the figures were 15 per cent. and 34 per cent. respectively.

Five of our cases (not included in Groups 1 and 2) of rheumatoid arthritis were examined by us on account of a recurrent diarrhœa (one case) or of a sore tongue (four cases), and six had no other symptoms but the joint affections. These showed achylia gastrica in four cases, hypo-acidity in five, and normal acidities in the remaining two. In all there was a marked improvement in the general health after acid therapy. The sore tongues and chronic diarrhœa were cured, although the arthritic conditions showed some relief in two cases. One patient has since ceased to take the acid mixture and now complains of a sore, dry tongue.

Debility.

Group 5.—Owing to the frequency with which debility and a varying degree of a secondary type of anæmia occurred in these patients, we investigated another series of 10 cases in which debility was the outstanding symptom and in which there were no other physical signs or definite symptoms. In four instances we found an achylia gastrica and in four a hypochlorhydria. In the other two the acidity was normal but there was a reduced peptic activity. Often the history of an indefinite debility extended over a considerable period. In one instance the patient had been operated on 13 years before for a suspected cancer of the stomach and since that time had led the life of a chronic invalid. In nine of these cases the administration of acid was followed by a marked improvement which relapsed if for any reason the acid was discontinued. In one case the improvement

was only temporary, but in this instance an intense neurasthenia was the predominant factor. In several of these cases the patient's appearance suggested the presence of a tuberculous focus, but no evidence of this could be obtained either clinically or radiographically. In this connexion, however, it should be remembered that achlorhydria is known to occur in 75 per cent. of cases with advanced phthisis, and the importance of eliminating its presence cannot be too greatly emphasised.

Conclusions.

From our investigations there can be no doubt that diminished or absent secretion of hydrochloric acid is very much more common than is generally supposed, and it may be associated with many conditions which at first sight appear to have little relation to one another. We are not concerned here with such well-known conditions as pernicious anæmia, postero-lateral sclerosis, and late gastric carcinoma.

We have endeavoured to show that in a certain type of case in which gastro-intestinal symptoms are present there is often a marked impairment of gastric secretion, which can frequently be diagnosed clinically and the clinical condition rectified by suitable therapy. It is not clear whether the achlorhydria or hypo-acidity is a primary condition responsible for the symptoms, or whether it is secondary to the gastro-intestinal disturbance. The prompt response to hydrochloric acid therapy would appear to support the former view. On the other hand, the recent work of Farrell, who produced an experimental colitis in animals and showed that it caused a secondary diminution in acid secretion, is in favour of the latter point of view, but the conditions are not comparable.

It appears to be more likely that the deficiency of hydrochloric acid and pepsinogen secretion is a primary condition, and that the absence of the natural antiseptic action of the gastric juice allows an abnormal bacteriological infection to occur in the intestinal tract. As a result, the patient suffers from an intestinal intoxication which may manifest itself in various ways according to the particular individual.

Taking the series as a whole, 76 out of 100 cases show either achylia or hypo-acidity, and a noticeable feature is the predominance of women over men, in the proportion of 55 to 21.

Since cancer of the stomach is very much more common in men than in women, achlorhydria in itself would not appear to be a common factor in its production, as has been suggested by Hurst.

Summary.

A preliminary report is presented in which an association has been shown to exist between a gastric secretory dysfunction and certain clinical conditions (excluding such well-known diseases as pernicious anæmia). A hundred cases have been examined and they fall naturally into five groups.

Group 1.—This group is a definite clinical entity characterised by gastro-intestinal disturbances and recurrent diarrhœa; flatulent dyspepsia and neurasthenia are prominent symptoms. The clinical picture is sufficiently characteristic as to allow the diagnosis of achlorhydria to be made with considerable certainty. There were 53 cases: 25 showed achylia gastrica and 18 hypo-acidity (8 with deficient peptic activity) on examination by fractional test-meal. At periods varying between four months and two years after the institution of treatment with a mixture of pepsin and hydrochloric acid 24 out of 28 are cured, whilst one is very much better, one is better but has occasional attacks of diarrhœa, one is not improved, and one died from subacute liver atrophy. One other case with a normal gastric acidity but diminished peptic activity was also cured by similar treatment. Fifteen cases with achlorhydria or hypo-acidity have been under observation for less than three months but are responding to treatment. Nine others with normal secretion or hyperacidity were not given this treatment.

Group 2.—Comprises 25 cases in which the prominent feature was a sore tongue or an ulcerative stomatitis. The gastro-intestinal disturbances met with in Group 1 may or may not be present. Fractional gastric analysis of these cases showed 9 had achylia, 6 hypochlorhydria (only one having a normal peptic activity), 7 with a normal acidity (four with reduced peptic activity), and 3 with hyperacidity. Treatment was difficult owing to the pain produced by the acid therapy, but ten cases after pepsin and hydrochloric acid therapy had been commenced have not had any further trouble and are now quite well after periods of 4–18 months; one was also quite well until she discontinued the treatment and she now complains of a sore tongue again. Of two with normal acidity, one is much improved and the other has failed to benefit by the treatment. Three with achylia and one with hypochlorhydria out of the nine other cases have responded to treatment, but have not been under observation for more than two to three months.

Group 3.—In five cases skin lesions were complained of in addition to the gastro-intestinal or glossitic symptoms, whilst one other had an urticaria and angioneurotic œdema. Achylia was present in four, hypo-acidity in one, and hyperacidity in one of the cases, and the administration of the pepsin-hydrochloric acid mixture completely relieved the condition in all but the last case.

Group 4.—Five cases of rheumatoid arthritis were examined; one associated with diarrhœa had a hypo-acidity, whilst in four, with histories of glossitis, three had achylia and one hypo-acidity. Six others showed achylia (1), hypo-acidity (3), and normal acidity (2). In all of them the administration of hydrochloric acid greatly improved the general health and apparently alleviated the joint symptoms in two.

Group 5.—Comprises 10 cases of debility with degrees of secondary anæmia, for which no cause could be found. Four had achylia and four had hypochlorhydria. All were very much improved after the administration of hydrochloric acid and pepsin, but one has since relapsed.

In these series the predominance in numbers of women over men is very striking; being 2·6 to 1 in the total number of cases showing deficient gastric secretion but 3·3 to 1 in cases with achylia gastrica.

We wish to thank the honorary physicians of the Manchester Royal Infirmary for kindly permitting us to include some of their cases.

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HOSPITAL ACCOMMODATION AT SWINDON.—The Great Western Medical Fund Society has recommended that the G.W.R. be asked to agree to the erection of a new hospital of 80 beds on the present site, the cost, estimated at £44,000, to be lent by the Company on mortgage. Should this course be followed, the suggested amalgamation with the Swindon and North Wilts Victoria Hospital will not take place. The Committee of the Medical Fund Society express the opinion that a voluntary basis and a friendly society basis cannot be satisfactorily amalgamated, and that a hospital run as a joint concern would not give the best results. The recent Swindon hospital carnival produced £2200.

BUCKS SMALL-POX PATIENTS.—The Buckinghamshire county council is desirous of providing a small-pox hospital for the southern part of the county, but the Ministry of Health refused permission for the use of a site at Beaconsfield. The Middlesex county council has now declined to allow of the purchase of the old small-pox hospital at Yeading belonging to the Uxbridge and District Joint Hospital Board on the ground that there is no small-pox hospital in the administrative county, that it is undesirable that there should be any such hospital, and that Yeading Hospital is in a rapidly developing district which will probably, in the near future, be the centre of a thickly populated area of working-class houses.

GRAPHIC BLOOD PRESSURE RECORDS:

A NEW CLINICAL METHOD.

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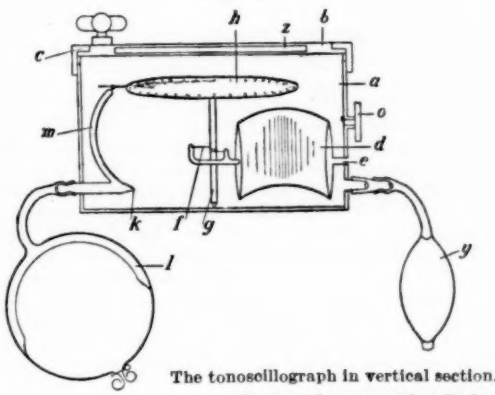
FOR many years it has been possible to obtain tracings of blood pressure by means of a kymograph. In clinical medicine, however, through lack of any satisfactory objective mode of registration, a numerical formula has had to represent "the complete arterial pressure picture." [1] A distinct advance has now been made by Prof. J. Plesch,[2] of Berlin, who, after several years' experiment, has succeeded in perfecting the Tonoscillograph, an instrument, which in its final form, ensures graphic and permanent records of arterial and capillary pressures, as well as of individual pulse characters.

The Apparatus.

Fig. 1 is a diagram of the apparatus in vertical section. The outer metal case (*a*) is made air-tight by the hinged lid (*b*), in which is set a glass window, and is fastened by means of the device (*c*). Inside the case (*a*) are two manometer systems. One of the manometers (*d*) communicates through the

FIG. 1.



The tonoscillograph in vertical section.

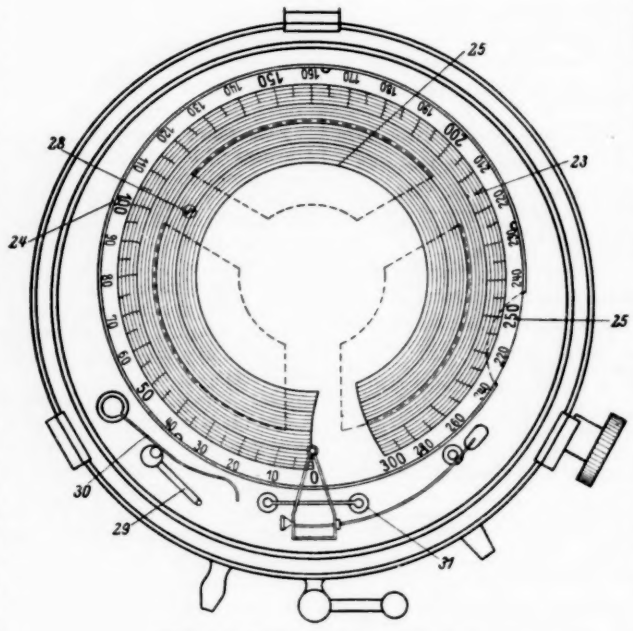
Figs. 1 to 3 by courtesy of Prof. Plesch.

aperture (*e*) with the outer air, so that the interior of this manometer remains constantly under atmospheric pressure. When the pressure within (*a*) is increased by the rubber inflating bulb (*y*) the manometer (*d*) becomes bent, thus causing the thread (*f*) to be unwound, thereby rotating the table (*h*) fixed to the spindle (*g*). The other manometer (*m*) has a capillary opening (*k*) into the case (*a*), and is in direct communication with the armlet (*l*). By pumping air into the case, the armlet simultaneously becomes inflated through the capillary opening (*k*). In this way the thin-walled and highly sensitive manometer tube (*m*) is protected from over-distension. Nevertheless, by means of the capillary opening, equalisation of pressure is secured, so that the external and internal pressures remain the same.

Attached to the manometer tube (*m*) is the writing pen (*n*), which records any movement directly on a graduated paper disc set on the table (*h*). Any increase in pressure caused by the pulse will, therefore, be recorded by this pen before the difference can be

equalised through the capillary opening (*k*). The size of this aperture can be regulated by a lever (shown in Fig. 2); it will readily be seen that the stronger the pulse and the smaller the capillary opening the larger will be the oscillations recorded by the pen. Should these oscillations become unduly large in the case of powerfully beating pulses they can be damped by increasing the size of the capillary aperture. The valve (*o*) facilitates even reduction of pressure in order that the disc may return to the zero position. During the time that the pressure is falling the pen (*n*) automatically, and in true accordance with the pulse volume, traces impulses, communicated by means of the armlet, on the disc in the form of a curve, the tonoscillogram.

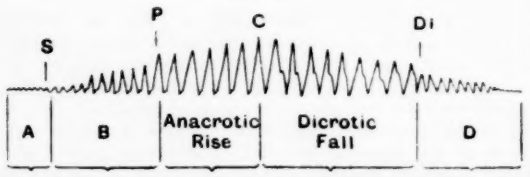
FIG. 2.



The tonoscillograph viewed from above.

Fig. 2 shows the apparatus viewed from above. At the top is the hinge upon which the circular metal lid surrounding the glass window turns in opening and closing. Opposite to this at the foot is the capillary lever mentioned above; to the left of this is a nozzle for the rubber tube connecting with the armlet, to the right an attachment for the inflating bulb; still further to the right a screw-valve for securing even release of internal pressure. The paper disc (25), graduated from 0 to 300 mm. Hg, rests upon a rotating aluminium table (23), the edges of this being represented in the diagram by broken lines. Tiny projections around its circumference hold the paper

FIG. 3.



The arterial pressure curve. A, Stages of approach, B, development, C, full oscillations, D, and pulsations respectively; S, systolic pressure; DI, diastolic pressure; P, point at which pulse waves increase to nearly double the height of the preceding waves.

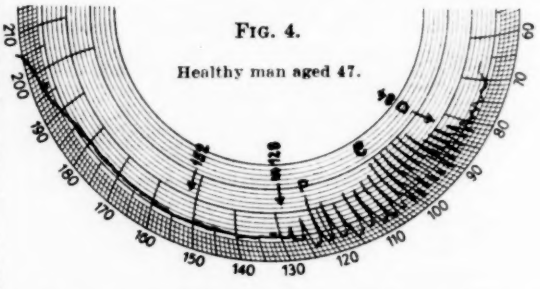
disc flat. Opposite (0) is the writing pen with angled supports by which it can be raised or lowered on a transverse bridge (31) actuated by the capillary lever. To the left of the bridge is a spring (30) for arresting movements of the table.

The Records.

Fig. 3 is an analysis of the curve of arterial pressure and volume obtainable with the instrument; the general form of the curve closely resembles those illustrating a paper of mine in 1911 on the sphygmo-oscillometric method of Pachon.[3] As the external pressure is allowed gradually to fall, an approximately even series of small undulations (A) appears as each successive pulse wave impinges against the upper point of arterial constriction. The point for the systolic pressure (S) is marked by the first of a series of slowly increasing waves which, after a varying stage (B) at the point (P) suddenly become almost double the size of the preceding waves. From this point up to the largest oscillation (C) the increase is much more gradual. Thence onwards the curve is flatter in type, the oscillations slowly diminishing to the point of diastolic pressure (D), at which they undergo a sudden reduction by half. Throughout the whole of the ascending portion of the curve each oscillation is seen to be separated by a flat interval, which becomes less as the highest oscillation is approached. Thereafter the oscillations assume a

FIG. 4.

Healthy man aged 47.



peak-like ascent. During the ascending portion of the curve the oscillations are anacrotic in form. During the descending portion they are dicrotic, but only as far as the point of minimal pressure. Beyond this point, the external and internal pressures being equalised, the pulse waves are represented by the stage of pulsations.

The foregoing stages are exemplified in the following curves of arterial pressure and pulse volume taken from cases under my care (Figs. 4 to 8).

In the case of a healthy man, aged 47 years (Fig. 4), the stage of approach extends from 152 mm. Hg to the point of systolic pressure (S) at 128 mm. Next comes a short developmental stage, denoting healthy tone of arterial walls, which ends at 124 mm. (P), from which point the stage of full pulse oscillations with flat anacrotic waves is continued, the intervals becoming less spaced and flattened at the base as they approach (C). Following the ascending portion of

the curve ending at (C), the waves become more uniform in amplitude (descending portion) with evident dicrotism, this ceasing abruptly at 84 mm., the point of diastolic pressure (D). The stage of pulsations completes the curve-analysis.

Fig. 5 is a case of early but typical hyperthyroidism in a lady aged 36, seen in consultation with Dr. R. Tudor Edwards, of Wembley. Herein the various stages of the arterial curve are clearly recognisable.

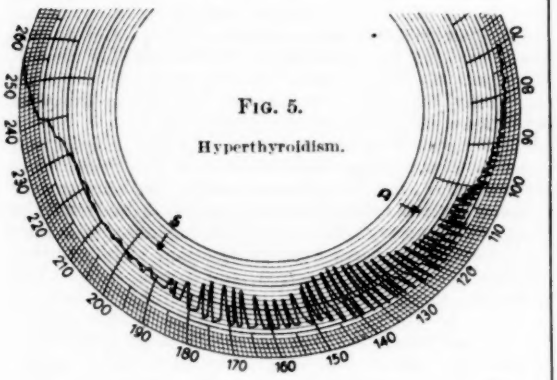


FIG. 5.

Hyperthyroidism.

Fig. 6 is the tracing of a man aged 60 years, 6 feet in height and weighing 15 stone, a teetotaller and non-smoker, athletic in his earlier years and fond of mountain climbing. The chief complaints were of "thumping in the head while in bed," and of pressure feelings referred to the vertex. The heart showed considerable left ventricular preponderance, and a systolic murmur was audible over the whole præcordium with ringing aortic second sound—a case of arterio-sclerosis. (S) is at 194 mm. Anacrotic ascent ends at 150 mm. Descent is gradual to (D) at 104, where dicrotism suddenly ends. Well-marked pulsations follow this point.

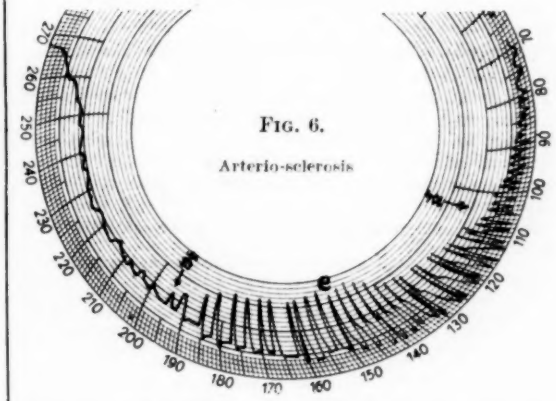


FIG. 6.

Arterio-sclerosis

In striking contrast to all other curves that I have yet had the opportunity of taking comes Fig. 7, that of a hospital patient, aged 67, housewife, whom I showed in 1925 at the Royal Society of Medicine [4] as a case of hyperpiesia, since established to be of gouty origin.

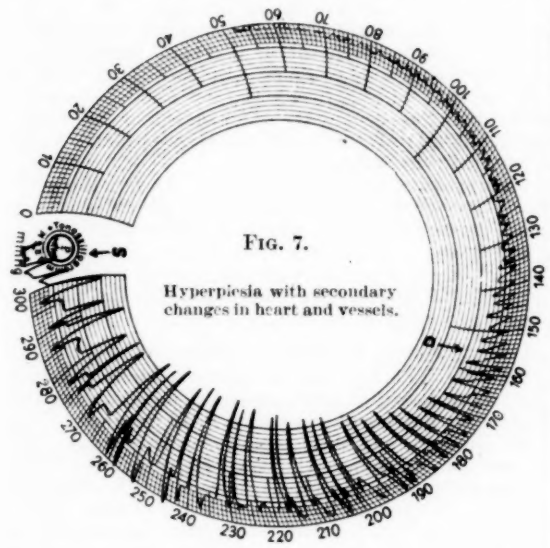


FIG. 7.

Hyperpiesia with secondary changes in heart and vessels.

The present clinical picture is one of cardiac dilatation consequent upon hypertrophy, and changes in the vessels arising independently of renal changes such as occur in the usual forms of Bright's disease. In February, 1930, hæmorrhage occurred in the left retina with impairment of vision two days later. One month after this blurring of speech was noticed, which persists. The arterial curve is of unusually bold character, despite the fact that the capillary lever was turned to the full extent so as to damp the amplitude of oscillations. Each pulse beat is seen to be enormous, corresponding clinically with a pulse of ful volume and high tension. At every third beat is a regular sequence of premature contractions. The systolic pressure is at approximately 306 mm., but cannot be precisely fixed because this sphygmomanometer, like the majority of others, has been constructed on the assumption that pressures above 300 mm. Hg cannot occur. This patient's pressure, however, when first seen was 320 mm. systolic, and I have had other cases in my own practice with maximal pressures above 300 mm. The diastolic pressure is reached at 155 mm., giving a differential pressure of about 150 mm.

Fig. 8 may be regarded as the opposite of Fig. 7 in that it is an example of very low arterial pressure. (S) stands at 94 mm., and (D) at 64, thus yielding a small differential pressure of only 30 mm. The amplitude of oscillation is comparatively tiny, although the capillary lever was set to the smallest opening so as to secure as large excursions of the pen as possible. The picture is one of low vitality and low resistance.

Comparison of tonoscillographic curves brings ou many additional points of fresh value and significance. The time factor is as yet far too short for me to enter into any detailed discussion of these. Hence I have put forward merely an outline sketch of the apparatus, and its possibilities in the belief that other workers may be sufficiently interested to profit by the opportunities that Prof. Plesch has so ingeniously afforded.

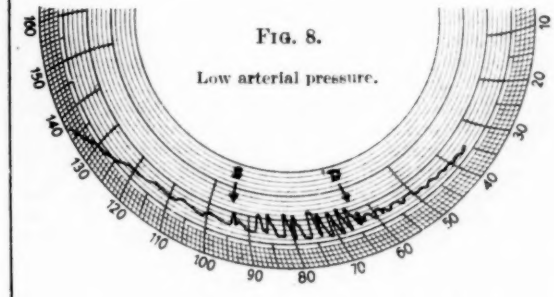


FIG. 8.

Low arterial pressure.

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3. Dally, J. F. Halls: THE LANCET, 1911, ii., 680.
4. „ „ „ : Proc. Roy. Soc. Med. (Clinical Section), 1926, xix., 13.

NEMBUTAL AS A BASAL HYPNOTIC IN GENERAL ANÆSTHESIA.

BY I. W. MAGILL, M.B. BELF.,
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THE use of the derivatives of barbituric acid as anæsthetics and hypnotics has been closely studied during the last two years, especially in the United States, and the literature is now extensive. Lundy quotes no fewer than 466 references.[1] As regards the use of the barbiturates in human surgery, one may draw the following conclusions from the latest reports[2]:—

1. The employment of a barbiturate as the sole anæsthetic is inadvisable.
2. As basal hypnotics the barbiturates are among the most valuable drugs available in surgery.
3. The suitability of a barbiturate as a basal hypnotic depends largely upon toxicity and shortness of action. The greater the toxicity the smaller is the dose required, and the smaller the amount of the drug to be detoxicated or eliminated. This results in a shorter period of recovery and lessens the disadvantages associated with prolonged hypnosis such as delirium and depression. The extra nursing care of a patient unconscious for many hours is also obviated.

Nembutal (sodium ethyl methyl butyl barbiturate) has these characteristics more clearly developed than any barbiturate so far discovered. It is about twice as toxic as sodium amytal,[3] and its action is much shorter. Lundy states[3] that it is more sedative than hypnotic and that it causes delirium and restlessness less often than other barbiturates. Nembutal (Abbott) is supplied in capsules (grs. 1½) for oral or rectal administration, and in ampoules (grs. 7½) for intravenous use after being dissolved in distilled water (10 c.cm.).

I have administered nembutal as a basal hypnotic to 262 patients. The intravenous route was used in 180 patients, whose ages varied from 9 to 74 years. Oral or rectal administration was employed in the remaining cases which included young children, the aged, obese subjects in whom the veins were not readily accessible, patients in whom the immediate operative risk was extreme, and some cases in which spinal analgesia followed. The age in these patients was between 3 and 84 years. The operations included laparotomy for various conditions, excision of the rectum, tongue or breast, exophthalmic goitre, tonsillectomy, and various plastic operations. Except in cases in which spinal analgesia was employed, the supplementary anæsthetic was nitrous oxide and oxygen with the addition of ether when necessary.

Administration.—Atropine (grs. 1/100) is given half an hour before operation and in adults morphia (grs. 1/6 to 1/4) in addition, providing no contra-indication exists. When the oral or rectal route is selected, nembutal in capsule is given to adults at the same time as the hypodermic injection. For children, for reasons to be given later, it is more satisfactory to administer grs. 1½ two hours before operation in order to judge the response, and to repeat the dose one hour before operation if the sedative effect obtained is insufficient. For intravenous injection a 10 c.cm. syringe is used with a fine hypodermic needle, and the solution is injected at the rate of about 1 c.cm. per minute.

Effect of the Drug.

1. When given by *mouth* or by *rectum* nembutal has a sedative effect which may amount to mild amnesia or actual sleep. In operations in which complete muscular relaxation is not required, supplementary anæsthesia can be maintained with nitrous oxide and oxygen, without cyanosis. Where complete relaxation is essential, the addition of ether is necessary, but the amount is much reduced. Irrespective of whether ether has been added or not, the sedative effect of nembutal continues for one to five hours after operation according to the reaction of the patient. There is a desire to sleep, and nausea and vomiting are diminished, or more usually absent. The patient can be easily aroused while in this state and may respond to questions, but the memory of events at this period is hazy or absent.

2. When administered *intravenously* the injection need not be begun until ten minutes before the time of operation, for the effect is quickly and accurately obtained. No calculation of dose on a body-weight basis is necessary, the amount being determined by the progressive effect during injection. The solution should be freshly prepared and quite clear. The injection should be carried out, preferably in bed, at the rate of about 1 c.cm. per minute, a close watch being kept upon the patient throughout. The most satisfactory method of judging the dose is to engage the patient in quiet conversation. The response to questions becomes gradually more and more indistinct, and without any period of excitement the patient passes into a quiet sleep. The dose is the minimum amount necessary to produce this effect after slow and careful injection. Intravenously, the minimum dose in this series was grs. 3, and the maximum grs. 7½. When sleep ensues after intravenous injection respiration is quiet, diminished in amplitude, and normal in rate.

It has been stated that a fall in blood pressure takes place during intravenous administration of a barbiturate,[1] but so far as careful digital determination goes, with nembutal the fall is trivial or absent.

During the course of the operation after intravenous injection the amount of the supplementary anæsthetic required is less than with oral or rectal administration. This is clearly the result of the more exact dosage by the intravenous route. In two laparotomies the amount of ether required to obtain complete relaxation was apparently independent of the action of nembutal. These cases were exceptional when compared with others.

Again, owing to the more accurate dosage, the post-operative effect following intravenous injection is more marked than with oral or rectal administration. Drowsiness or sleep from one to five hours after operation is the usual course, with hazy memory for events during that period. In a few instances the patient was fully conscious on return to bed.

POST-OPERATIVE COMPLICATIONS.

Irrespective of the dose or method of administration, a variable degree of restlessness was noted during the immediate post-operative period in 13 patients. Five were children, and their condition was controlled by potassium bromide. Of the eight adults, five responded to morphia hypodermically and the remaining three continued to be restless for several hours. One patient who required a considerable amount of ether to obtain relaxation for the removal of a retrocæcal appendix began to vomit persistently on the third day after operation. There was much abdominal pain and some distension which did not abate until the eighth day. On the ninth day this patient died suddenly, apparently from pulmonary embolus. No post-mortem examination was obtained, and it is questionable whether nembutal was in any way responsible for this result. In one female patient who stated that she bruised very easily an

inflammatory reaction followed the escape of a small quantity of the solution into the subcutaneous tissue.

COMPARISON WITH OTHER BARBITURATES.

In order to compare the results obtainable with other barbiturates, sodium amytal was administered intravenously in 23 cases, and pernocton in 15. All these patients were adults.

Induction of pre-operative sleep with sodium amytal compares favourably with nembutal, but the recovery period is much longer. Pernocton has been reckoned equal to nembutal in toxicity,[2] and the recovery period is about equal. This drug has the advantage of being supplied in solution ready for use. In my brief experience with pernocton, induction of sleep is not so pleasant for the patient, or so uneventful as with nembutal. During injection one patient became violently excited, and in two others there was nausea and retching. One of these patients had previously received nembutal without any such effect.

Discussion.

As with other barbiturates the variable reaction of individuals to nembutal renders the dosage by mouth and by rectum difficult to determine beforehand. This is especially noticeable in children. In general, it may be stated that children are more resistant than adults, and in children the variation has little to do with age or development. For example, one well-developed child aged 7 was fast asleep after the administration of grs. 1½, while another child aged 5, and of small physique, was quiescent, but not asleep after grs. 3 had been given. And yet it has been possible to produce definite amnesia in some adults with grs. 3 only.

It is in the intravenous use of nembutal, however, that the greatest advantage lies. By this method it is possible to determine the dose accurately during injection of the drug. Here, again, the reaction of the patient seems to bear little relation to age, body-weight, or habits. For example, a man aged 33, weighing 15 st., and having an alcoholic history, responded perfectly to grs. 6 before appendicectomy. He was easily controlled, and well relaxed with nitrous oxide and oxygen and about 3 drachms of ether, without any suboxygenation. At the same time several women of slender build and temperate habits required as much as grs. 7 to produce the desired effect.

Whatever the dose, patients are unanimous in their appreciation of this method of induction and the general lessened tendency to nausea and vomiting. This has been borne out particularly in many patients who had been previously anæsthetised on several occasions. These include some who have had experience of avertin and ɪ araldehyde. They include, also, five doctors.

Intravenous injection of a drug in connexion with anæsthesia is open to criticism as an unnecessary complication not unattended by danger. If injection is carried out carefully and slowly, with aseptic precautions, it need involve little more risk, and certainly no more discomfort, than a hypodermic injection. From the adult patient's point of view, a prick with a hypodermic needle is usually expected before an operation, and to many it is more acceptable than the retention of a rectal injection of any kind. Intravenous injection of nembutal is available, further, when rectal pre-medication is ruled out by the nature of the operation. It requires a minimum of apparatus and preparation. It is carried out by the anæsthetist himself without the necessity for his attendance a considerable time before the operation. There is, also, no question of a nurse being called upon to share the responsibility of administration.

Many patients dread an anæsthetic more than the operation itself. By intravenous injection of nembutal it is possible to mitigate these circumstances in a large majority of cases. It is perhaps needless to add that a drug of such potency should only be in the hands of experienced persons fully conversant with all the principles of general anæsthesia. Its use is not recommended as a routine, but only in such cases where the necessity is indicated.

Summary.

(1) Intravenous injection of nembutal provides a pleasant method of bridging the gap between consciousness and unconsciousness before general anæsthesia. (2) The amount of anæsthetic subsequently required is diminished. (3) Post-operative nausea and vomiting are diminished or absent. (4) The chief disadvantage is post-operative restlessness in a small percentage of cases (about 10 per cent.).

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3. Lundy: Anæsth. and Analg., 1930, ix., 210.

CLINICAL AND LABORATORY NOTES

A CASE OF TEAKWOOD DERMATITIS.

By Elizabeth Hunt, M.D. Liverp.,

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Although it is known that workers with teak may suffer from irritation of the skin, the actual number of cases reported is small.

A man, aged 30, presented himself at hospital on May 8th, 1930, complaining of an irritating dermatitis of the dorsal surfaces of the hands and forearms, the face and neck, and the genitals. He stated that the condition had begun on April 10th, and had lasted three weeks, when he had returned to work for three days, but had been forced to stop again owing to recurrence.

In May, 1929, he had had a similar attack, which had lasted three weeks and had been succeeded by boils on the trunk and styes on the eyelids. He was employed as a shipwright, and on detailed inquiry as to the nature of his work it was learnt that he had been transferred from metal plates to woodwork, and he believed that the eruption occurred on each occasion after handling teak.

On examination an erythemato-vesicular eruption was observed on the dorsal surfaces of both hands and on the forearms. The face and neck were erythematous, with marked œdema round the eyes. He complained of extreme irritation. The skin was not abnormal otherwise, and no pathological condition was found on physical examination.

The eruption responded rapidly to sedative lotions but, as in the previous year, after subsidence of the acute condition a small number of boils developed.

When recovery was complete the patient was taken into hospital for observation, to investigate his sensitiveness to teakwood before returning to work. On June 4th he was given a piece of freshly sawn teak (Rangoon) to hold in his hand for an hour. Six hours later he complained of irritation on the backs of the hands. The following day there was an erythematous eruption on the backs of the hands and on the face, and the eyes became œdematous; this condition gradually increased in severity until the third day after touching the wood, when there was a well-

marked erythemato-vesicular eruption on the dorsum of the hands, the lower third of the forearms, and the face and neck, and the irritation was severe. The condition readily responded to treatment with ichthyol in a zinc calamine lotion.

The effect of teak dust and various teak extracts on healthy skins was investigated by Hoffmann,[1] and as a result of his experiments he came to the conclusion that the irritant action of teak was due to the presence of free unsaturated resinic acid, especially in the dust of freshly cut wood. Willmott Evans [2] considered that the aromatic oil in the heart wood was the essential cause. In the case under consideration the wood used for the test, though freshly sawn, had been in the timber yard for some time. The dust was not applied and heart wood was not used. Some other explanation must therefore be sought.

The interesting features of the case are: the marked susceptibility to, and the shortness of the time of contact with, the irritant; the early onset of symptoms of irritation, which were localised at first and then gradually spread to other regions, although the source of irritation had been removed; and the similarity in the train of symptoms on each occasion, and in their duration.

The simplicity of the method used to test the case suggests that similar methods might be employed with advantage in those numerous medico-legal cases which are now arising where claims are made for compensation for dermatitis due to dyes and other causes.

UNDULANT FEVER

ACQUIRED FROM A GOAT IN ENGLAND.

By Walter Broadbent, M.D. Camb. F.R.C.P. Lond.,

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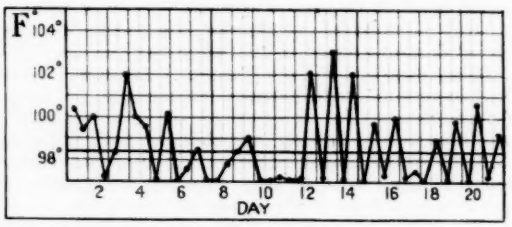
A boy, aged 3½, was admitted to the Royal Alexandra Hospital on August 8th with a history of having been ill and running a temperature for a month, with no abnormal physical signs until the day before, when he had complained of pain and stiffness in the neck. On admission he lay on his side with his head retracted and his knees drawn up. His head could only be moved slightly without causing pain. There was a blotchy erythematous rash on the body and limbs. He was quite conscious, and his pupils reacted to light. The optics discs were normal. His plantar reflexes were found to be extensor, his knee-jerks were not obtained, and Kernig's sign was doubtful. The diagnosis then made was tuberculous meningitis, and a lumbar puncture was done, but the fluid came out only under slight pressure and no abnormality was found in it. The temperature came down to normal on the 12th and remained so until the 18th, when it went up to 102° F. at night and 103° F. the next night. It had fallen to normal again by August 23rd.

I saw him for the first time on August 24th. He looked to me more septic than tuberculous. His tongue was furred and his breath heavy; acetone had been found in his urine. His bowels were constipated. I could not detect any enlargement of the spleen, nor any abnormal signs. The two waves on his temperature chart made me suggest undulant fever as the diagnosis. A blood count gave a leucocytosis of 16,000, which was against tuberculosis and in favour of undulant fever, though there was no relative increase of lymphocytes, which is said to be usual; polymorphonuclear cells numbered 71 per cent. and lymphocytes 28 per cent. The agglutination test for *Brucella abortus* was negative in all dilutions, but on August 28th the report of the



Temperature chart from August 7th to 27th.

blood culture was—"Growth of very small Gram-negative organisms arranged as paired cocci or short chains of three or four. Short bacillary forms also present. *Brucella melitensis*." No growth was obtained from the urine.

The house physician, Dr. L. P. Clarke, then got into communication with the child's doctor, Dr. Ronald Matthews of Crawley. Dr. Matthews reported that goats had recently come to the farm where the child lived, but that the child had not drunk any goat's milk. However, exactly 14 days after he had first met the milkman who kept the goats, he had developed his first symptoms. The Ministry of Health, on being notified, examined the goats, and found that the blood of one of them agglutinated *Brucella melitensis* in a dilution of 1 in 25. This goat had also aborted twice. This, then, is a case of undulant fever acquired from a goat. Nearly all the cases of undulant fever in England have been due to the *Brucella abortus* of cows.

Sir Weldon Dalrymple-Champney's Report on undulant fever, which can be obtained from the Ministry of Health, gives a quite complete account of the various types of the disease and their causes. He points out that infection may occur from milk, cream, or cheese, but also from dust, or from handling skins, as the bacilli are excreted in the urine of infected animals for some time. It is evidently by this latter means that the child was infected, as he did not drink any of the goat's milk. He has now recovered.

I am much indebted to Dr. Lionel P. Clarke for his notes and his keen investigations in regard to this case.

TREATMENT OF QUINSY BY LAUGHTER.

By C. R. Croft, D.M. Oxf.

The following tale of the late Dr. John Budd is told in Whitfeld's "History of Plymouth and Devonport." [1]

"An old lady with a tumour in the throat he asked to see him on the following day. She did so, and as she took a seat, a dish of boiled dumplings was placed upon the table. Without a moment's notice the doctor pelted his assistant with these missiles, the assistant retaliated, and the pair

[1] Hoffman, H.: Zentralbl. für Gewerbehyg., 1926, iii., 333.
[2] Evans, Willmott: Brit. Jour. Derm., 1905, xvii., 447.

[1] Whitfeld, H. F.: Plymouth and Devonport. In Times of Peace and War. Devonport, 1900, p. 543.

cut such sorry figures that the aged sufferer was seized with a fit of uncontrollable laughter and burst the abscess."

It seems probable that the tumour was a peritonsillar abscess, though admittedly this is uncommon in the aged. The method of treatment is physiological to a degree and deserves further inquiry.

The mechanism is obscure. Sir Arthur Keith gave his opinion that such an abscess would burst under the action of the middle constrictor of the pharynx. I can find no reference in the literature to the movements of the palate during laughter.

A crude examination of the throat in the act of laughing shows two main features, first the descent of the root of the tongue, and secondly the very marked and rapid elevation of the soft palate and the upper part of the faucial arch, presumably by the action of the levator palati. The pillars of the fauces appear to be flaccid and fall together, while the tonsil lying between them does not ascend but rather is held steady by the tongue, or may even descend a little with it. The act of laughter would, therefore, open up the space between the tonsil and the faucial arch, while the suddenness and spontaneity of the action would tear down any adhesions which might be present between these parts.

The following case shows the use of this principle:—

On March 31st, 1930, I saw a married woman, aged 35, with a well-developed attack of acute follicular tonsillitis. On April 3rd swelling and redness above the left tonsil showed that a peritonsillar abscess was impending. On Sunday, April 6th, this was mature, and the patient was suffering very considerable discomfort. The pus seemed to lie deeply, with the origin of the abscess in the posterior part of the supratonsillar recess. I offered her the consolation of the knife but, being a very nervous woman and her relatives away from home, she was averse to the procedure, and I did not press it. Later in the day I returned, prepared at all costs to relieve her discomfort. It transpired that her mother had known Dr. Budd, and it only remained to regale her with the story told above to evoke what laughter her condition would permit.

The effect was dramatic, for, leaning her head over the side of the bed, she evacuated half an ounce of pus into a basin beneath, with immediate relief of her pain and subsequent uninterrupted recovery.

Devonport.

MEDICAL SOCIETIES

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

A MEETING of this Section was held on Nov. 21st, 1930, when Prof. A. H. DAVIDSON gave a presidential address on

Puerperal Sepsis.

Recently work on the bacteriology of the genital tract before and after labour suggested, he said, that the commonest type of severe puerperal sepsis—that due to hæmolytic streptococci—was always an exogenous infection. Non-hæmolytic streptococci were constantly present in the vaginal flora and when resistance was lowered they became virulent and gave rise to an endogenous infection. Predisposing factors played a large part in the causation of sepsis—e.g., lowered resistance due to albuminuria, hæmorrhage, anæmia, or laceration or bruising of the soft parts. Vaginal examination and intra-uterine manipulation must be reduced to a minimum. Many deaths from sepsis followed manual removal of the placenta, an operation which was sometimes rendered necessary by unskilled conduct of the third stage of labour. By way of prophylaxis the patient must be kept in good condition throughout pregnancy and labour. When sepsis had developed, good nursing and the relief of any distressing symptom were of great importance. Drainage of the uterus by postural treatment was essential, and the patient should be made to sit upright in bed for short periods five or six times daily. Intra-uterine douching or exploration should be carried out only when it was reasonably certain that something had been left behind in the uterus. Rheinstätter's curette should never be used in a septic uterus. Hysterectomy and ligation of the pelvic veins had a small place in the treatment of uterine sepsis, but the results were not very encouraging. Many other methods—e.g., glycerin drainage, vaccines and sera, intravenous injection of antiseptics—had had their successes, but none was specific.

Sir WILLIAM SMYLY said that meddlesome midwifery was clearly bad. New methods of interference were frequently introduced, greatly praised, and widely practised for a time, and then fell into disrepute. He thought that at present the chief duty of doctors in connexion with puerperal sepsis was prevention.

Dr. T. M. HEALY thought that nursing did more to help the patient's recovery than any drugs at present known. The chief requirements were sleep and nourishment.

TWO GROUPS.

Dr. GIBBON FITZGIBBON said that cases of puerperal sepsis fell into two distinct groups: (1) those in which the woman after delivery had her tissues undamaged, and (2) those in whom there had been protracted labour, with prolonged devitalising pressure on the soft parts. In group 1 the infection was due to an invasion by pathogenic organisms of a host with a normal resistance. The woman probably had pre-existing susceptibility to infection. In most of these cases the infection was exogenous, due to carriers, indirect contacts, or faulty operative technique, but occasionally the woman was her own carrier—having, for instance, a quiescent dental root infection, or chronic but quiescent infection of the tonsils. The infective organism was always a streptococcus though not necessarily hæmolytic. Such women might have developed general septicæmia after a tooth extraction or an accident. In group 2 the tissues were devitalised by labour. The infecting organism might be exogenous or might belong to the normal flora of the body (staphylococcus, colon bacillus, or non-hæmolytic streptococcus), becoming virulent as a result of tissue damage. In group 1 the course of the disease was like that of any acute infection. The patient might recover in a week or less; she might struggle on and succumb; she might develop enough resistance to localise the disease when recovery would depend on the site of localisation and the possibility of evacuating an abscess; or after weeks of illness she might succumb with partial localisation, or recover without it. The main treatment was general raising of the personal resistance by good nursing, comfort, feeding, and the avoidance of decubitus. When the disease had continued for seven to ten days, localisation must be watched for and treated according to its nature—e.g., multiple

abscesses in the uterus requiring hysterectomy, cellulitis, or purulent peritonitis. In group 2 the local condition was important from the outset. The tissue damage might be so great that nothing could be done. The condition was a gangrene; extirpation with a healthy margin might be effective, and was occasionally possible by hysterectomy, but a margin could seldom be obtained, for the parametrium was involved and the result depended upon the patient's resistance holding out until local demarcation had taken place. In this group were infected perineal tears, vaginal tears, and prolonged labours, followed by infection by staphylococci or *B. coli*. Debilitated women who developed thrombosis and phlebitis were usually infected by not very virulent organisms which were localised early or cleared up without localisation, but if the infection was virulent they made little resistance and died rapidly.

Dr. BETHEL SOLOMONS summarised his opinions as follows: (1) It is wrong to preserve an attitude of watchful expectancy because some treatments do good; at the same time, known harmful treatments should be avoided, and these included intra-uterine douching, digital exploration of the uterus, and curettage. (2) There is a definite but small place for hysterectomy, which if not done too soon or too late will certainly save lives. (3) Glycerin has a *very* small place in treatment; it is especially useful when there is suppression of lochia. (4) To await definite localising signs in every case would retard progress in knowledge. The fact that a patient developed pneumonia, said Dr. Solomons, did not mean that she had not sepsis, for pneumonia was often an end-result of sepsis. This nullified the value of statistics about sepsis, for many cases which were reported as deaths from influenza or pneumonia should rank as septic death. When a patient died of sepsis after Cæsarean section it did not necessarily mean faulty technique; the patient was often profoundly infected at the time of the operation. As regards forceps, it must be admitted that any operation increased the risk of sepsis, but it was often unfortunately necessary to apply forceps to save infant life. The lying-in institution was a safer place than the private house, but the statistics would necessarily always show a higher incidence-rate of sepsis in the former, because of the difficult cases sent in.

MEANS OF IMPROVEMENT.

Dr. D. G. MADILL said that the report on puerperal sepsis submitted to the last London congress showed 247 cases with 87 deaths—i.e., nearly 33 per cent. Of the 87 deaths, 19 had spontaneous delivery and 68 had active interference. Of the 160 recoveries, 42 had normal labour and 118 active interference. It must be concluded that there were cases of autogenous infection, and this view was supported by the investigations of FitzGibbon and Bigger. In the above series 60 different methods of treatment were used. To prevent sepsis it was necessary to do away with meddlesome midwifery, including unnecessary forceps delivery, and raise the standard of the district nurse by extending her training and by insisting on short post-graduate courses every few years. The one advance in active treatment was the cessation of douching and of the use of the blunt curette. Exploration of the uterus was only permissible if a piece of placenta was known to be retained, or in certain cases to take an intra-uterine culture. When the disease had set in there was no unanimity of opinion on the treatment to be used. It would be useful if the masters and ex-masters of the maternity hospitals would say how they would manage a case (1) in the early stage, or when infection was strongly suspected, and (2) when the disease was established. A great many of the cases listed in the reports of maternity hospitals as normal deliveries did not deserve the term at all, because the women had been in labour for a long time and the tissues were considerably devitalised, and this trauma of the tissues led to sepsis later on. The lines laid down for the treatment of any case of fever seemed to Dr. Madill the best for puerperal sepsis.

Dr. R. J. ROWLETTE said there had been very little advance in the treatment of puerperal sepsis in the last generation or two, whatever advance there might have been in prophylaxis; but he thought that ideas about the causation were now a good deal clearer. The organism most frequently found was the *Streptococcus hæmolyticus*, but there were some cases of acute sepsis due to the *Staphylococcus aureus*. These cases could not be explained as being caused by contamination during the investigation. *S. aureus* was not a common organism in cultures made from the circulating blood. Other organisms were frequently found present in the uterus, such as *Bacillus coli*, but he thought it very doubtful whether *B. coli* was ever the cause of the infection. The suggestion that anaerobes played an important part had never, he thought, been substantiated. One practical advance in the treatment of puerperal sepsis was the abolition of douching. There was evidence also that chemotherapy was injurious. In no condition of bacterial infection was there any reason to suppose that antiseptics introduced into the blood stream had any value. He had often been impressed by the satisfactory results obtained when autogenous vaccines had been given as soon as possible. He had also seen cases in which remarkable results had followed the use of serum, but he thought this could not be depended on, and believed that better results were obtained with vaccines than by serum, while their combined use might also be successful.

Dr. A. P. BARRY said it was necessary to be certain that a case was really septic, for many cases were treated for sepsis in error.

Dr. G. TIERNEY held that before any advance could be made with vaccines it was necessary to try to estimate the resistance of the patient's blood. At present no such method was available. In acute septic infection the resistance of the patient was so lowered that a vaccine might make the patient worse, and the same was true of sera.

Prof. R. E. TOTTENHAM said he always used vaccines in septic cases, and had had very good results. He referred to the danger of imperfect isolation in small private hospitals.

Dr. R. M. CORBET pointed out that many treatments hurt the patient very considerably, and the pain lasted for some time. He thought that there was no treatment which was specific, and that any which was not specific, and which caused the patient a good deal of pain, should be discarded.

Dr. A. J. HORNE maintained that the curtailment of vaginal examinations by students and midwives was very desirable.

Dr. D. J. CANNON referred to vaginal discharge in pregnancy.—Dr. NINIAN FALKINER described a case in which Radiostoleum and S.U.P. were apparently useful and a vaccine after localisation had occurred.

THE ROYAL SOCIETY.

THE CROONIAN LECTURE.

THE Croonian lecture[1] was given on Dec. 11th by Prof. JULES BORDET (Brussels), who was formally welcomed as a foreign member of the Society. He chose as his subject

The Theories of the Bacteriophage.

He began by referring to the striking facts connected with bacteriophagy: that a bacterial culture, grown on the surface of an agar medium, became sprinkled with holes; that a broth to which had been added the active principle was thereby rendered unsuitable as a culture medium; that a turbid microbial suspension, obtained by emulsifying the culture from a solid medium, became clear; and that the active principle regenerated itself in producing its effect. It was, he said, easy to obtain the active principle; it was often found in water, soil, or fæcal materials. Vaccine lymph very often contained a principle acting on the staphylococcus. Gratia, by a whole series of experiments, had proved the absolute identity of the phenomena of Twort and of d'Herelle. It was soon recognised that a number of these principles existed, and that one which acted on a staphylococcus did not necessarily produce any effect on *Bacillus coli*, but sometimes one principle attacked several related species of microbes. When a principle specific for a certain species was brought into contact with another species, its virulence for the latter became enhanced with successive transmissions. The specificity of the principles and their power of adaptation were very variable.

Prof. Bordet outlined the experiments on which d'Herelle had based his virus theory of the bacteriophage. The fact that, in adequate dilution, the spots of lysis on an agar colony were well defined and isolated, was taken by d'Herelle to prove that the virus was present in a corpuscular form and not in a state of solution. In reality, however, the conception of the principle as corpuscular did not strictly involve its being a virus. It lost its activity when heated to about 70°C. It was very probably a colloid, and colloids were, in a sense, composed of particles. Possibly also it might be absorbed by the bacterial debris, and thus be deposited with this debris at certain points on the agar surface. Moreover, even if it were in solution, the phenomenon of isolated spots would still be observed. It was certain that contact with bacteria sensitive to its action was necessary for its reproduction. If gradually diminishing volumes were introduced into a microbial suspension, an extremely weak dose—whether of a virus or of an active principle in solution—would not affect more than a small number of the bacteria present. Individual microbes were not identical, and it was highly probable that they were not all equally sensitive to the lytic principle. When one bacterium succumbed to the principle it became a centre for the regeneration of the agent, which, therefore, became more abundant in the immediate neighbourhood, and could then attack more resistant individuals. Therefore a spot of lysis would appear on each point of the agar on which a more sensitive bacterium had rested. Filtration experiments seemed to show that the molecular or micellar dimensions of the principle were analogous to, if not smaller than, those of the colloidal particles of different albuminoids.

[1] The lecture will be published in full in the next issue of the Proceedings of the Royal Society.

OBJECTIONS TO THE VIRUS THEORY OF D'HERELLE.

The virus theory was seductive by reason of its great simplicity, but the extraordinary resistance of the principle to storage and to the action of chloroform were objections to the presence of a virus. If a very weak dose were introduced into a tube of bouillon inoculated with the sensitive organism, the bacteria would multiply for a few hours, and then the turbid liquid would clarify suddenly; it was difficult to suppose that an intrabacterial virus would attack all the microbes at a given moment almost simultaneously. The facts would be easier to reconcile with the theory of an extrabacterial virus secreting a diffusible ferment, but d'Herelle had shown that the principle could only develop in the presence of living organisms. The regeneration of the principle seemed to be correlated with the bacterial multiplication which preceded the lysis. This seemed favourable to the theory Prof. Bordet had proposed with Cinca ten years before: that the bacterium itself secreted the lytic principle, and that bacteriophagy was in reality an autolysis. With Jaumain he had established that the sensitive bacteria must be not only living but also able to multiply. Lysis and degeneration did not occur in normal saline, but a little peptone or meat extract produced both. The antilytic serum produced in a rabbit retained its activity when heated to 60° C.; a virus that showed such good resistance to storage and chloroform ought not to be destroyed in this way. Stassano and de Beaufort had found that sodium citrate hindered the lytic effect, and Prof. Bordet had shown that the elimination of calcium suppressed the lysis in bouillon and hindered the regeneration of the principle. All the principles required some calcium, but they did not all require the same dose.

BACTERIOPHAGY AND AUTOLYSIS.

The theory of Bordet and Cinca was that the bacteria themselves reproduced the lytic principle. The intense lytic action called bacteriophagy represented the pathological exaggeration of a physiological process. The normal function which in some way acted as the source from which the phenomenon of bacteriophagy originated might have some relation to the phenomena of mutation. Individual microbes of the same species exhibited appreciable differences among themselves. Distinct types became constituted, and an equilibrium might be established between them. The maintenance of this equilibrium could not be easily explained unless there were corrective influences to discipline the evolution of the species by repressing the tendency of certain strains to excessive preponderance. In this regulator-mechanism should be sought the factors determining the appearance of bacteriophagy.

The first difficulty in this conception was the essential transmissibility of the bacteriophage, which was very simply explained on the theory of a filter-passing virus. The theory of autolysis implied that the sensitive bacteria already possessed materials necessary for the formation of the principle before they were brought into contact with it. This idea was quite plausible on a physiological basis; as an analogy might be cited thrombin, which brought about its own reproduction. One of its constituents, serozyme, existed in the plasma in the form of an inactive mother substance, prosserozyme. Thrombin had the power of transforming prosserozyme into serozyme ready to unite with cytozyme to form thrombin. The process was initiated by contact with some foreign body, but when once a certain amount of thrombin had been formed the contact was no longer

essential for the continuation of the process. If it be imagined that the physiological mechanism which presided over mutations was the primary cause of the lytic principle, it was to be presumed that the effects of the principles would bear some relation to the phenomena of mutation, and that the behaviour of different types of bacteria in culture would manifest an antagonism revealed by lytic phenomena analogous to those of bacteriophagy. Prof. Bordet then described experiments which confirmed this presumption. For instance, a bacteriophage very active on *B. coli* would not act in a very weak dose on an enormous quantity of bacilli; it seemed to disappear for a time. It was hard to suppose that a virus would disappear when presented with too great a quantity. In a slightly stronger dose, however, the lytic principle would reproduce itself, but the principle thus formed was modified and was distinguished by the name of "weak principle" in that it only produced a very incomplete lysis. The modification was really qualitative and not quantitative, for even in high concentration the "weak" principle only produced a partial lysis. It could also be produced by allowing ordinary principles in a moderate dose to act for a very short time only on a large inoculation of *B. coli*. In other words, if the experiment were so planned that the principle acted exclusively on the most sensitive microbes, these regenerated a lytic agent which was so exclusively adapted to them that thereafter it would only act on microbes exactly like them. Thus the individuality of a given type of microbe was reflected in the qualities of the principle which it was capable of elaborating.

SMOOTH AND ROUGH TYPES AND THE WEAK AND STRONG PRINCIPLES.

An experiment which revealed the connexion between the effects of the principle and the origin of mutations was based on the separation of old cultures of *B. coli* into "smooth" types and "rough" types. The types could be isolated pure, but the smooth tended to give rise to the rough again, especially in bouillon; and the rough, though more stable, could, in time, produce individuals of the smooth type. The weak principle attacked by preference and with great vigour the smooth type, while the rough type presented a pronounced resistance. If a tube of bouillon were inoculated with a drop of the weak principle and a drop of the culture of the smooth type, the liquid remained clear for some hours and then the rough type appeared and multiplied luxuriantly. The smooth culture under the influence of the weak principle underwent a complete metamorphosis into a rough culture absolutely identical with rough cultures produced by separation. In view of these results it was plausible to think that the weak principle might represent a more active form of a substance which the smooth type would normally produce, and which would have the power of making the rough type appear at its expense.

The resistance of the rough type to the weak principle depended very much on concentration. This fact also was unfavourable to the virus theory. After a series of transfers the principle became adapted to the rough strain, and could thereafter be reproduced by making it act on the normal rough type. It had not, however, lost its power of causing lysis of the smooth strain, and, therefore, deserved the name of "strong" principle. Bail and Asheshov had recognised that a single bacteriophagic liquid might contain two principles distinguishable by the size of spots of lysis which they caused on agar. Gratia had identified the principle adapted to the smooth strain ("weak") with the type producing large spots, and the strong principle attacking the rough strain with the type producing small spots. The phenomenon of resistance distinguished the principle, as it was highly specific. The weak principle had no action on the dysentery bacillus, while the strong principle had a powerful action.

If the weak principle could become the strong principle, it was conceivable that the weak principle was itself derived from a principle still weaker, which might be the normal physiological substance responsible for the appearance of the rough at the expense of the smooth strain. If a drop of smooth culture were spread over the whole surface of an agar slope and a small droplet of the weak principle introduced and made to flow down the axis of the surface of the medium, incubation showed a clear stripe of lysis down the middle, bounded by an increasingly thick layer of culture. The layer of microbes contiguous to the clear stripe became slightly transparent, surrounding the stripe with a halo of 2 or 3 mm. thickness. The power of causing a halo seemed to belong only to the weak principle, and the halo was visible because in this region the smooth culture took on the aspect of the rough, as if this metamorphosis were beginning to be accomplished. The weak principle introduced into a suspension of smooth *B. coli*, either living or killed by heat, caused a strong agglutination, but the strong principle did not. It was strange that the weak principle which brought about the metamorphosis from smooth to rough was just the one with the power of agglutinating microbes of the smooth type, even when dead.

In conclusion, Prof. Bordet described experiments indicating that a microbic culture is the seat of perpetual inter-reactions between the individuals which compose it. The appearance of the lytic power seemed to be the index of spontaneous differentiation, but this power contributed to the guidance of evolution in the cultures, since it induced modification in certain receptive types.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING of this Society was held at the London School of Hygiene and Tropical Medicine on Jan. 2nd and 3rd, with Prof. W. W. C. TOPLEY in the chair.

A. B. ROSHER (London) had made a systematic search for influenza bacilli in the trachea at autopsies over a period of nearly two years. The proportion of positive results varied from 60 per cent. in the winter to about 15 per cent. in the summer and the curve of frequency corresponded well with the curve of recorded deaths from influenza. Most strains were indol-positive.—S. C. DYKE (Wolverhampton) described a case of giant-cell tumour (osteoclastoma) originating in the patella, and after six years causing death with widespread metastases in the lungs and elsewhere.—H. L. SHEEHAN (Manchester) had studied the taking up of phenol-red, methylene-blue, and other dyes by the kidney from the blood. Precisely what happens remained undecided, but the results are difficult to reconcile with the Cushny theory of kidney activity.—S. L. BAKER (London) had found that β radiation of radium killed the virus of the Rous sarcoma and the bacteriophage with more difficulty than ordinary bacteria, but much more

easily than it destroyed enzymes and complement.—W. E. GYE (London) confirmed Fujinami's claim that his fowl sarcoma would grow well in ducks.—C. H. ANDREWES (London) showed that the serum of fowls bearing a slow-growing fibro-sarcoma generally had the power of preventing infection with the virus of the Rous sarcoma. The sera of some normal fowls did the same.—W. E. GYE and W. J. PURDY (London) by inoculating a goat with filtrates of the Rous sarcoma had obtained a serum which would prevent infection with that tumour and with several other bird tumours. Evidence of the existence of two different antibodies was obtained, only one of which needed complement for its action.—W. SMITH (London) had found that his strain of herpes virus almost constantly produced focal necrosis of the suprarenals in rabbits.—G. H. EAGLES and D. MCCLEAN (London) made out a good case for their having obtained abundant multiplication of vaccine virus outside the body in a medium free from living cells.—W. W. C. TOPLEY, M. GREENWOOD, and J. WILSON (London) had found that mice on a natural diet of oats, milk, and water, resisted infection with food-poisoning bacteria better than if they had excess of vitamin A or cabbage, carrots, or mangolds.—H. W. CROWE (London) described some experiments on the bactericidal power of blood.—J. H. DIBLE (Liverpool) showed some curious toxoplasma-like parasites which he had found in the kidneys of mice.—C. H. BROWNING, D. F. CAPPELL, and R. GULBRAUSEN (Glasgow) said that splenectomy made no difference to the occurrence or course of infection of mice by *Trypanosoma congalense*.—L. P. GARROD (London) had found that many organisms of the group causing thrush gave a common reaction when examined by precipitin absorption.—A. T. GLENNY and MOLLIE BARR (London) showed the great antigenic superiority of diphtheria toxoid precipitated with potash alum.—R. W. SCARFF (London) had found that splenectomy before the injection of typhoid bacilli much reduced the production of agglutinins, while splenectomy after injection left the animals response unchanged. With injections of foreign red blood corpuscles, preceding splenectomy made no difference to the response, while succeeding removal greatly diminished it.—J. W. BIGGER (Dublin) analysed the influence of various factors on the production of hæmolysin by staphylococci: the most important thing is to keep the reaction neutral or on the acid side.—J. W. BIGGER and W. BOXWELL (Dublin) described a very clear case of auto-hæmagglutination in a patient with a severe anæmia amenable to liver treatment. It was impossible to do a blood count or make a proper film except at body temperature.—A. FELIX (London) discussed the O antigen and P. B. WHITE (London) the absorption of agglutinins.—R. A. Q. O'Meara (Dublin) analysed the basis of the Voges-Proskaner reaction and demonstrated a new and delicate test for the production of acetoin.—J. D. A. GRAY (Liverpool) showed that the salmonella group of bacilli were especially resistant to the salts of lithium which could usefully be incorporated in media for their discovery and isolation.—W. J. LOGIE (Falkirk) described a case of fatal subpial hæmorrhage caused by a blow which produced no injury to the skull: the perforating arteries were apparently torn through in the cerebral commotion.

DEMONSTRATIONS.

The following demonstrations were also given:—W. G. BARNARD (London): teratoma of ovary with teratomatous metastases in the peritoneum; dermoid cyst of brain; embryonic tumour of kidney; rupture of aorta with dissecting aneurysm; foreign body erosion of aorta.—W. E. GYE and W. J. PURDY (London): series of sporadic fowl tumours.—T. HARE (London): patent ductus arteriosus in an old horse.—J. A. BRAXTON HICKS (London): ganglionic neuroma; cavernous hæmangeiomata of gracilis and lattisimus dorsi muscles.—J. C. G. LEDINGHAM (London): elementary bodies in virus diseases; the lining of experimental abscesses with epithelium.—G. R. CAMERON (London): the intravitam staining of bone with lady's bedstraw and other plants allied to madder.

EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this Society on Dec. 19th, 1930, with Dr. H. S. DAVIDSON, the President, in the chair, Dr. JAMES DAVIDSON gave an account of histological changes in

The Liver in Eclampsia.

He had found that the changes in the liver were often much more severe and widespread than is usually recognised. At least three different types of lesion were found—namely, necrosis of the cells of the peripheral zones of the lobules; widespread necrosis of the cells in the central and mid-zones; and in certain cases no gross hepatic lesions, but only small areas of focal necrosis. These pathological changes were found (*a*) in cases which clinically were typical of eclampsia, with fits, high blood pressure, &c.; (*b*) in cases with fits and low blood pressure; (*c*) in cases with no fits and high blood pressure; (*d*) in cases with no fits and low blood pressure. In other words, cases diagnosed clinically either as eclampsia or as a severe toxæmia of pregnancy were seen to have the same pathological lesions. Dr. Davidson discussed the striking resemblance of the more severe type of liver lesion to "acute yellow atrophy," and contrasted the renal changes with those found in the liver. He suggested that the renal lesions were to a certain extent secondary to the hepatic condition.

Rupture of the Uterus.

Dr. R. EVERETT reported on a case of traumatic rupture of the uterus at the fourth month.

The patient, an unmarried girl of 18, was thrown off the pillion of a motor bicycle going at 30 miles per hour. She was admitted to hospital in a dazed condition, and for several days suffered from cerebral irritation associated with a moderate degree of shock and pulse-rate of 120. She had also a Colles's fracture of the left forearm. She gave a history of having missed four periods. There were apparently no abdominal symptoms. She had a slight vaginal discharge from that time for seven weeks when she was readmitted into a gynæcological ward. She was then found to have a hard mass in the right iliac fossa, which was thought to be a hæmatoma of the abdominal wall which had undergone some calcification. On account of the bleeding, curettage was performed, and a few fragments of what appeared to be retained placenta were removed by the curette. The patient was discharged a week later, having had an uninterrupted convalescence with no further bleeding.

Three weeks later she reported at hospital and stated that she was feeling well and had returned to work two days previously. The mass on the right side appeared to be harder, and a radiogram was taken which revealed a lithopædion on the right side. A lipiodol examination was carried out and it was found that the lithopædion was separated from the uterus and was outside the tubes, which suggested that the uterus had ruptured at the right side. At operation the lithopædion was removed with some difficulty; there were numerous adhesions both to it and to the uterus.

The patient was discharged from hospital three weeks after operation, after a satisfactory convalescence, and when she came back, two months later, it was found that her periods were regular while the uterus appeared to be mobile and completely involuted.

REVIEWS AND NOTICES OF BOOKS

Emergency Surgery.

By HAMILTON BAILEY, F.R.C.S., late Surgeon, Dudley Road Hospital, Birmingham; Assistant Surgeon, Liverpool Royal Infirmary; and Surgical Registrar, London Hospital. Vol. I. Abdomen and Pelvis. Bristol: John Wright and Sons, Ltd. 1930. Pp. 380. 25s.

THIS book is written by a surgeon who has been engaged in emergency surgical work for a number of years. He has kept careful notes of his cases and his opinions have strong claims to consideration. A better name for the book would have been Emergency Operations; for there is no systematic account of the clinical features or diagnostic problems of acute abdominal or pelvic diseases; the information on these subjects is scrappy. But when it comes to operative procedures, Mr. Hamilton Bailey describes clearly and succinctly those methods of treatment which he has found most satisfactory in practice. In general this book forms a reliable guide. There is little to cavil at, and the author merits praise for the high standard which is consistently maintained. Only here and there are his recommendations open to criticism. For instance, in our view stovaine is not the safest nor the best anæsthetic for spinal use (p. 144); the advice to sever the bowel just above a fistula in the upper part of the small intestine and unite it to the transverse colon (p. 275) is not the most satisfactory way to treat this condition; and ileostomy for obstruction, apparently recommended on the authority of Richard Warren (p. 183), is surely open to the objection that the fistula is liable to be made in physiologically obstructed intestine, thus ensuring disaster. The descriptions are mostly so clear and concise that the account of exposure of the kidney on page 277 comes as a disappointment.

We predict that this book will be used widely by that numerous group of surgeons who are called upon only occasionally to deal with surgical emergencies. If they follow the advice offered in these pages with skill their emergency surgery will be of a high standard.

Die Zerebrospinalflüssigkeit.

By Prof. Dr. Med. V. KAFKA. Hamburg: Franz Deuticke. 1930. Pp. 400. M.30.

THE name of Kafka is familiar to English physicians chiefly on account of two reactions with cerebro-spinal fluid, the hæmolysin test of Weil and Kafka, and the paraffin-sol reaction. But his claim as an authority on the cerebro-spinal fluid rests much more on the pioneer work which he published in the years 1910 to 1912 on the presence of ferments in the fluid and the permeability of the choroid plexus in health and disease. We therefore welcome a volume which not only includes the results of this work, and of the abundant later researches which have been founded on it, but brings the whole subject up to date. An unexpectedly large part of the book consists of a discussion of the composition and manner of formation of the cerebro-spinal fluid and its relation to the blood plasma. The part dealing with the changes in disease is relatively small and slight, and technical details receive only passing mention. After a short description of the cells, bacteria, and parasites found in the fluid, a fairly long section is devoted to physical properties such as viscosity, spectroscopy, freezing-point, refraction, pH, and alkali reserve. This is followed by a very full description and discussion of the chemistry of the fluid and of the ferments, hormones, complement, antibodies and other less understood complexes which it may contain. A rather short but interesting chapter on the changes found in various diseases constitutes the second quarter of the book. An account of the changes in the fluid in general paralysis before and after malarial treatment contains much that is unfamiliar in spite of the many papers which have been written on this subject.

The third quarter of the book is a discussion of the formation and absorption of the cerebro-spinal fluid. Here the author is surrounded by a superabundance of documentary evidence, much of which is mutually contradictory, and it is hardly surprising if he sometimes fails to make out a clear case for either side. As regards the mode of formation of the fluid he considers as unproved the dialysation hypothesis of Mestrezat, which has recently been so ably advocated by Walter. The arguments against this hypothesis which he finds most convincing are derived from experiments which indicate that the percentages of such substances as calcium and chloride, which normally differ in blood and cerebro-spinal fluid, become identical when blood is dialysed against fluid. These experiments contradict others by Mestrezat and Fremont Smith, at any rate in so far as they relate to the chlorides, and are so full of possible sources of error that until they are amply corroborated they form an insufficient basis for the rejection of the dialysate theory as a whole. Similarly, while the author rejects the theory of von Monakow, which postulates a circulation of cerebro-spinal fluid through brain tissue, and that of Hassin, who supposes that the function of the choroid plexus is to absorb and not to secrete fluid, he does not give any clear statement of his own views on the circulation and absorption of the fluid. Thus in spite of much critical analysis of various theories the 80 pages devoted to this subject give us little that is new.

The last quarter of the work consists of a bibliography, nearly 100 pages long, which indicates both the author's scholarship and the immensity of the literature dealing with the cerebro-spinal fluid. For clinicians the book may be disappointing, since so much space is taken up with theoretical considerations and the discussion of abstruse points that little is left for practical details, but research workers and those to whom the subject is already familiar will find in it a remarkably complete résumé of what is already known and many suggestions for further investigations.

Introduction to Mental Hygiene.

By ERNEST R. GROVES, Research Professor of Sociology, University of North Carolina; and PHYLLIS BLANCHARD, Psychologist, Philadelphia Child Guidance Clinic. London: Gerald Howe, Ltd. 1930. Pp. 467. 16s.

MENTAL hygiene implies reform and education as regards major and minor mental disorder, and difficulties in social or family adjustment, and this book gathers together the many threads by which it makes connexion with practical problems. The mental hygiene movement has grown rapidly in the United States, and, since it involves a radical readjustment of our views and judgments upon motives and conduct, this extensive résumé of its activities makes us

wonder what influence it will ultimately have. "This profound task of salvaging human nature" (p. 28) might suggest the crank, but such matters as the mental hygiene of childhood, the school, business and industry, of religion and social work, are kept in close contact with reality and handled objectively. But the suggestions for class-room discussion and for written reports at the end of each chapter are likely to lead to satisfaction with verbal exercises, and it is doubtful how far the inner emotional resistances present in everyone can be removed by the intellectual approach. A brief acknowledgment leaves the reader to think that Freud's chief contribution to mental hygiene was in pointing out the important rôle of the "psychic trauma" in the ætiology of the psychoneuroses, the working out of a technique for the discovery of the trauma, and the re-education of the patient without the use of hypnosis, whilst Prof. Groves invites discussion of the causes of "parent fixation" after a chapter in which no mention is made of the original use and meaning of that conception. Perhaps the authors decided that to discuss unconscious processes would destroy the simplicity of the subject as they present it. So far as the principles of mental hygiene can be elaborated with that limitation they have produced a useful and up-to-date book.

Diseases of Infants and Children.

By F. M. B. ALLEN, M.D., M.R.C.P. Lond., Assistant Physician, Belfast Hospital for Sick Children. London: Baillière, Tindall and Cox. 1930. Pp. 595. 15*s*.

THIS book is intended to provide senior students and practitioners with a practical manual of disease in children. Theoretical considerations are avoided as far as possible, and symptomatology and treatment considered in detail. A praiseworthy feature is the great proportion of space which is devoted to the commoner diseases which are of real importance in practice. In the chapter on infant feeding the author has made simplicity his principal object, and has certainly achieved it, though possibly at the cost of providing a somewhat limited range of method. The descriptions of the symptoms of common diseases are well done, and will impress the student with the importance of clinical observation, while much recent work has been included in the accounts of treatment. A useful appendix contains details of some laboratory tests and therapeutic measures.

The book is a sound guide to the practical side of pædiatrics.

Die Erkrankungen der Leber und Gallenwege.

By Prof. Dr. GEORG LEPEHNE. München: J. F. Lehmanns. 1930. Pp. 163. M.6.

THIS little volume was written for the *Münchener Medizinische Wochenschrift* and is now published for the first time in book form. It is a short and clear account of diseases of the liver and gall-bladder primarily intended for the general practitioner. After an initial account of pathology, diagnosis, and therapy in general, the succeeding nine chapters are devoted to liver disorders and diseases, and the last two only to pathological conditions of the gall-bladder and bile-ducts. This is, however, no unfair division, and the chapters on the whole are well balanced. Prof. Lepehne writes definitely and concisely and states the problems at issue fairly and impartially. Biliary drainage, liver function tests, and cholecystography are carefully described. The chapter on catarrhal jaundice, which the author, in line with most present-day authorities, regards as a mild acute hepatitis and not primarily as a catarrha l obstruction, is interesting, and the reader will find other suggestive and provocative paragraphs in this volume. The author's object was to provide diagnostic help to the clinician at the bedside and in no sense to compile a laboratory or technical handbook. This object has been admirably achieved.

Diet in Disease.

By GEORGE A. HARROP, Jr., M.D., Associate Professor of Medicine, Johns Hopkins University. Philadelphia: P. Blakiston's Son and Co., Inc. 1930. Pp. 404.

THIS should prove a useful handbook for those engaged in medical practice. Approximately one-half of the book is occupied by an account of the principles of nutrition and the special properties of common foods, and the remainder is devoted to the dietetic treatment of those diseases and disturbances of nutrition in which regulation of food is commonly acknowledged to play an important part. The subject is treated throughout along thoroughly practical lines, from the point of view of the physician who is anxious to give good advice to the individual patient. The principles determining the construction of suitable diets for such conditions as obesity, undernutrition, anæmia, nephritis, diabetes, and gastro-intestinal disorders are dealt with in turn, and sample diets are given. Among the appendices to the volume will be found food-tables, cooking recipes, and a useful account of the Jewish dietary laws.

Applied Electrocardiography.

By AARON E. PARSONNET, M.D., F.A.C.P., and ALBERT S. HYMAN, A.B., M.D., F.A.C.P. London: Macmillan and Co., Ltd. Pp. 206. 17*s*.

IN the closing paragraph of their introduction, the authors of this book express the hope that it may serve to remove that inferiority complex from which the general practitioner is apt to suffer when he contemplates the use of the electrocardiograph. Whether they have succeeded in that object seems doubtful, but the pages which follow appear to provide more than adequate nourishment for such a complex. In a book intended for students and general practitioners it is quite unnecessary to devote 30 pages to the description of various types of electrocardiographic apparatus. The working mechanism is of no interest to the practitioner; all he wants to know is when and how the instrument will help him in his practice.

In these circumstances dogmatism would be excusable. The subject must be simplified as much as possible. To introduce such generally discarded theories as that of auricular fibrillation being due to causes other than circus movement (p. 106) can only serve to confuse the novice. Again, the interpretation of several of the curves is incorrect. For example, the record on p. 93 is clearly one in which a paroxysm of tachycardia has supervened in a case of bundle branch block, and is not, as is here stated, a case of ventricular tachycardia. Again, the oscillations in Fig. 25 are obviously due to circus movement and not to tremor of the somatic muscles, in which the deflexions are neither so regular nor so slow. The statement on page 6 that the Q.S.U. waves may be

relegated to unusual conditions is misleading, while the new terms "incidental" and "fundamental" as applied to extrasystoles scarcely justify their application. The best chapter is that dealing with the electrocardiographic findings in coronary arterial disease; but taken as a whole the book strikes us as hardly suitable either for the beginner or the expert.

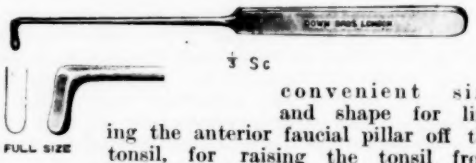
Indian Journal of Medical Research.

THIS issue (Vol. XVIII., No. 2, October, 1930) comprises 366 pages, a special feature being the introduction of a purely clinical paper on Heart Disease in the Punjab by T. A. Hughes and Mohammad Yusuf; 24 out of 35 cases showed valvular disease, 13 being instances of mitral stenosis, which is interesting because rheumatic fever is generally regarded as rare in the tropics.—S. L. Sarkar describes some peculiarities in malaria temperature charts, and concludes that in hyperendemic areas malaria is more resistant to quinine treatment and more liable to relapse.—C. Strickland and K. L. Chowdhury report on malaria and blackwater fever in Naomundi, while T. A. Hughes and D. L. Shrivastava continue their studies on the enlarged malarial spleen.—W. J. Webster also reports further observations on rat fleas and the transmission of plague, and finds that the three Indian rodent xenopsylla readily feed on man in the absence of a more suitable host, even at temperatures of over 80° F. Hot weather was least favourable to *X. braziliensis*, a cold season least suitable to *X. astia*, whilst *X. cheopis* thrived at all periods. In conjunction with G. D. Chitre the conclusion was reached that the chief factor in the spread of plague in Bombay is connected with the blocking phenomenon. The flea species factor is important in so far as a higher *astia* ind x is required for the progress of plague than will suffice in the case of *cheopis* or *braziliensis*.—A. Vasudevan and N. Seshadrinathan report on some atypical cases of mycetoma, the special features being the peculiar situation and macroscopical appearance of the lesions.—T. A. Hughes and his colleagues record further observations on the serum calcium and plasma cholesterol in health and disease. They confirm their past findings that serum calcium in normal residents of the Punjab is higher than for temperate climates. The blood chemistry of osteomalacia is also considered.—R. McCarrison continues his researches on lymphadenoid goitre in rats, the size of the thyroid gland of albinos being specially considered, while Sankaran reports on the iodine content of the normal thyroid in the latter animals. The effects of high protein diet on this gland are also considered by M Carrison, who finds the high concentration of animal protein in the diet does not cause thyroid enlargement in grown rats, the main factor being deficiency in fat-soluble vitamins.—S. Ranganathan contributes two papers on the composition of urinary calculi, the nuclei of which are shown to be mainly composed of uric acid or urates.—Lucy Wills and M. M. Mehta record the production of pernicious anæmia (bartonella anæmia) in intact albino rats by feeding on diets deficient in vitamins A and C. Their experimental results show that it is possible by diet to produce a severe megalocytic anæmia, especially in female animals. In reality, however, the condition is really a bartonella anæmia occurring in intact animals. *Bartonella muris* was readily demonstrated in the red cells, whilst splenectomy also showed that all their Coonoor stock was infected with it.—P. A. Maplestone has studied the seasonal variation in hookworm in India, and V. T. Korke writes on filaria prophylaxis, the first step being, in his opinion, to keep the cement drains of cesspool systems in strict sanitary order. *Culex fatigans* was found to breed in all systems of drainage under winter and summer conditions.—The number closes with a note by Seymour Sewell on *Cercaria anomala* Rao.

NEW INVENTIONS

A TONSIL-EXPLORING HOOK AND A TONGUE DEPRESSOR.

I HAVE found the instruments herewith illustrated of great use in the investigation and after-treatment of tonsil cases. The *tonsil-exploring hook* is of a



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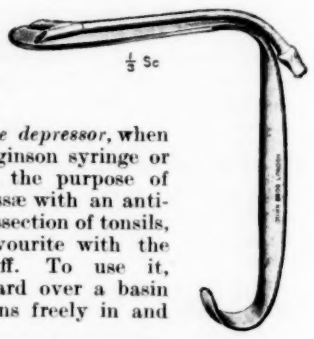
convenient size and shape for lifting the anterior faucial pillar off the tonsil, for raising the tonsil from the posterior pillar, for pressing upon the tonsil to squeeze out secretion, and for investigating crypts. The instrument is made in stainless steel. and being somewhat hollowed and rounded, admirably serves its purposes without causing injury.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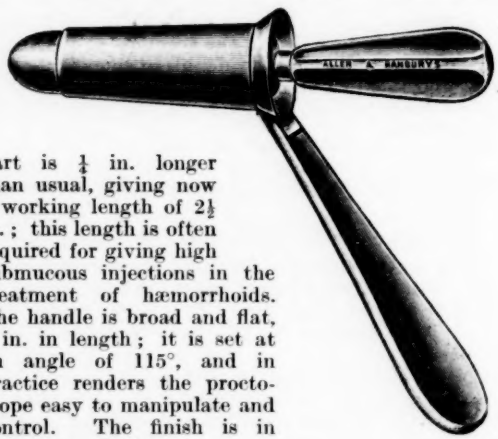
The *irrigating tongue depressor*, when connected with a Higginson syringe or irrigating can, serves the purpose of douching the tonsil fossæ with an antiseptic solution after dissection of tonsils, and has proved a favourite with the hospital nursing staff. To use it, the patient sits forward over a basin so that the lotion runs freely in and out of the mouth.

The instruments have been made for me by Messrs. Down Bros., St. Thomas's-street, London, S.E.

Clifton. C. OSMOND BODMAN, F.R.C.S.E.

A MODIFIED KELLY PROCTOSCOPE.

THE instrument here illustrated is a modification of the well-known Kelly proctoscope. The tubular



part is ¼ in. longer than usual, giving now a working length of 2½ in.; this length is often required for giving high submucous injections in the treatment of hæmorrhoids. The handle is broad and flat, 5 in. in length; it is set at an angle of 115°, and in practice renders the proctoscope easy to manipulate and control. The finish is in chromium plating.

The instrument has been made at my suggestion by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.

W. B. GABRIEL, M.S. Lond., F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, JANUARY 10, 1931.

THE RISKS OF VACCINATION.

THE Committee on Vaccination, appointed jointly in 1926 by the Minister of Health and the Medical Research Council—now known briefly as the Rolleston Committee—has issued a further report,[1] in continuation of Part II. of the report of Feb., 1928, in which the nature and occurrence of acute disease of the central nervous system after vaccination was studied. This earlier report[2] made a series of ten recommendations of which the first four on the technique of vaccination were implemented by the Vaccination Order of 1929 and came into force in October of that year. Since that time a trial has been made of vaccination in one insertion with a minimum of trauma, in place of the previously advocated four insertions, and it is rather striking that among the 90 cases of nervous disease set out in the present report, only two are known to have been vaccinated by the one-insertion method. Steps are also being taken, we understand, to comply with recommendation (7) suggesting a revision of the syllabus of instruction of medical students in the light of present-day knowledge of vaccination. The next recommendation was to inquire if it might be possible to increase the dilution of vaccine lymph without impairing its efficacy, and evidence is submitted that a skilled vaccinator using lymph diluted to one in a hundred may be successful in every case, the local reaction being much the same as with a one in five dilution, but with less indication of systemic reaction. The bulk of the report is occupied with an account of the 90 cases of post-vaccinal nervous disease brought to notice since the earlier report, the available clinical information being correlated with post-mortem findings in the 25 fatal authenticated cases. In an appendix is a translation of Sir GEORGE BUCHANAN'S valuable report to the Office International which gives the experience of the Netherlands and England up to May of last year. A summary of this appendix appears on p. 97 of our present issue. From this it appears that in the recent large-scale attempt to protect the population of Holland from imported variola encephalitis appeared in the proportion of one in 3437 children vaccinated between 1 and 2 years, and one in 815 vaccinated from 6 to 11 years. While all this spadework was necessary to make the story complete, it is admitted that its results do not add materially to our knowledge of post-vaccinal nervous disease. One small item of new knowledge is that the symmetry which usually characterises the distribution of the lesions may be absent, as in one case set out they were limited to one side of the spinal cord. Speaking generally, the claim that the lesions of post-vaccinal encephalitis are similar to, if not identical with, those of the nervous affections observed after certain other acute infections, notably the exanthems, has received further support, although attempts made at the Lister Institute to obtain some evidence of the presence of a virus transmissible to rabbits and monkeys have not met with success. No condition simulating post-vaccinal nervous disease has so far been produced by inoculation of monkeys with this material either by the intracerebral, intramuscular, or intravenous routes. Nor was it possible to confirm BLAXALL'S demonstration (1923) of the presence of vaccinia virus in the brains of these monkeys.

Attention is called to the experience of J. HEKMAN during the vaccination campaign in Holland. Following, although independent of SIR THOMAS HORDER'S use of convalescent serum,[3] it occurred to HEKMAN to attempt to reduce the toxic effects of vaccinia in children by giving serum of their recently vaccinated parents. His success induced E. PASCHEN to organise the collection and preservation of sera from recently vaccinated young hospital nurses. Whether or not we are able completely to accept the view of GRÜNEBERG and HEKMAN that vaccinia is alone responsible for the encephalitic sequelæ, their results supply a powerful argument for the use of human antivaccinial serum in these cases at the earliest possible moment. It is now just a matter of chance whether this remedy happens to be available, and the Rolleston Committee suggest that the example of Prof. PASCHEN might be followed by the authorities of large residential institutions, particularly those which require recent vaccination as a condition of admission. In default of human serum Prof. LEDINGHAM and Dr. PETRIE have prepared an antivaccinial serum by immunisation of a horse, and this is now available for trial.

Although, as we have said, the report may contain no substantial addition to our knowledge of the pathology of post-vaccinal nervous disease, it should be widely read for the adequate picture which it gives of an acute nervous disease with a mortality-rate of nearly 50 per cent. continuing intermittently to appear, now here and now there, with manifest disregard to the incidence of any known factor other than vaccinia. The quality of the lymph does not appear to have been a determining factor, for in the Netherlands epidemic the lymph used had come from Paris, Hamburg, Vienna, Berne, and other European centres, and even from Japan and the Dutch East Indies. In our own country the use of every variety of lymph has at one time or another been followed by nervous disease. The disease is associated with characteristic changes in the brain and cord similar to those found in acute nervous conditions following influenza, measles, and variola. Like them it is dependent on a precedent infection, but differs in that it follows the infection with great regularity within a definite limit of time. There is nothing in the circumstances of the cases

[1] Ministry of Health. Vaccination. Further Report of the Committee. Observations on the Epidemiology and the Clinical and Pathological Character of Post-vaccinal Nervous Disease, with Certain Collateral Papers. Cmd. 3738. Pp. 114. 2*s.* 6*d.*

[2] See THE LANCET, 1928, ii., 233.

[3] THE LANCET, 1929, i., 1301; 1930, ii., 307.

described in the present report which has not its parallel in previous experience. The age-incidence remains as before. Two-thirds of the patients were children of school age; the youngest child, whose death was certified as due to acute anterior poliomyelitis, was aged 1 year and 8 months. No clinical features not previously observed have been met with; but it may not be without significance that in two cases there was congenital absence of a kidney, and a third had chronic ulceration of bladder with degenerative changes in the kidneys.

LOW GASTRIC ACIDITY.

OPINION on the significance of the gastric acidity has shown considerable changes of late years. When fractional test-meals were introduced there was a tendency to attribute most "dyspeptic" symptoms and many disorders of the stomach to alterations in gastric secretion. A reaction then followed in which the importance of muscular tone and peristalsis in the causation of pain, hunger, and other sensations was more clearly appreciated. Even now we are at least partly ignorant of the precise function of the hydrochloric acid of the stomach. It is certainly a valuable bactericide which helps to protect the alimentary tract from swallowed organisms, but its remarkable variations in health and disease suggest that in other ways it may be more intimately concerned with the functions of the body.

In our present issue Dr. J. F. WILKINSON and Dr. T. H. OLIVER call attention to certain clinical conditions associated with an absence or deficiency of hydrochloric acid in the stomach. The constancy of achlorhydria in pernicious anæmia and subacute combined degeneration of the cord has, of course, long been recognised, and it may be an essential factor in their causation. The fact that it does not disappear, although in other respects the pernicious anæmia may be cured and the blood count become normal, suggests that the achlorhydria is at least a primary if not an inherent or constitutional deficiency. That it is actually often a hereditary abnormality is well known and is exemplified by a family described by WILKINSON and OLIVER in which it was present in three generations examined. It is, however, a frequent finding unassociated with anæmia, when it is commonly secondary or acquired as, for example, from chronic gastritis. Over 100 years ago BROUSSAIS, on the strength of his autopsy findings, considered gastritis to be the cause of almost every variety of pathological condition—even measles. Nowadays many authorities believe that gastric ulceration and often gastric carcinoma follow long-standing gastritis, and there may certainly be a low acidity in gastric ulcer patients, which actually increases after treatment and cure of the ulcer. Low or absent acidity is also a common, though by no means constant, finding in carcinoma of the stomach. The causes of gastritis—and thus of many cases of achlorhydria—may be partly exogenous, and KNUD FABER[1] thinks that achylia is always the result of a preceding gastritis. This, he suggests, may often be due to a deep-seated hæmatogenous infection in childhood, when an apparent anacidity is common. Thus it is found especially in such acute infections as influenza, tonsillitis, diphtheria, and the like, and may perhaps persist in later life. The relative frequency of constitutional and acquired achlorhydria is hard to estimate; its significance, therefore, as evidence of gastritis, is even more so. In either case the part it may play in the causation of symptoms and disease cannot easily be determined. In some cases achlorhydria is associated with diarrhœa, and in this type the condition is often familial. Such lienteric diarrhœa has long been noticed and is discussed by WILKINSON and OLIVER, who report 53 cases in which it formed part of an "achlorhydric syndrome," usually with accompanying neurosis. Typical lienteric diarrhœa, in which the bowels are opened almost immediately after every meal, is probably due to rapid emptying of the stomach and irritation of the gut by food inadequately prepared by the stomach, and similar conditions may certainly follow gastro-enterostomy. But it is by no means common, and the syndrome described by WILKINSON and OLIVER is not so easily recognisable clinically; it may even be found (they admit) with hyperacidity, and a test-meal is therefore essential in the diagnosis. Of 100 cases which they have studied 76 showed achylia or hypo-acidity, and of these 76, 43 had gastro-intestinal symptoms and diarrhœa. Of 100 normal patients (over 60 years of age) studied recently by D. T. DAVIES and T. G. I. JAMES,[2] 44 showed diminished or absent free hydrochloric acid, but gastro-intestinal symptoms were apparently absent. In DAVIES and JAMES's series no case showed an absence of pepsin, whereas a number of WILKINSON and OLIVER'S patients showed deficient peptic activity. It is thus obvious that apparent achlorhydria may be commonly present without obvious ill-effects. The exact method used to obtain the gastric juice is clearly of importance, and the use of histamine has shown that many "achlorhydrias" are, in fact, false achlorhydrias in which acid secretion follows its injection. Fear and pain alone may inhibit the acid secretion, and the excess of women over men in WILKINSON and OLIVER'S cases suggests that such inhibition may have played some part in the results.

The frequency of gastric anacidity in certain clinical conditions is more than coincidence—e.g., in rheumatoid arthritis, in pulmonary tuberculosis, in acne rosacea and some other skin diseases, in asthma, and in chronic cholecystitis and appendicitis. On the other hand, many such cases show a high degree of acidity, so that achlorhydria can hardly be a direct ætiological factor. As a secondary secretory abnormality its correction might therefore be expected to produce but little benefit. In lienteric diarrhœa the value of hydrochloric acid and pepsin in treatment is undoubted. In other conditions achlorhydria may well be the result of gastritis, and if so it would be rational to treat, if possible, the underlying disorder in

[1] THE LANCET, 1927, ii., 901.

[2] Ibid., 1930, ii., 899.

the hope of re-educating the stomach to secrete its own acid—as has lately been done by A. F. HURST [3] in a case of pernicious anæmia itself. None the less, nutrition may well be improved by the temporary use of acid in suitable cases and possibly WILKINSON and OLIVER'S unusually successful results are partly attributable to the high dosage they have employed.

THE PSYCHOLOGY OF ACCIDENT NEUROSES.

UNDER the name of *Unfallsneurosen*, or accident neuroses, Dr. MAX EYRICH [4] discusses what we are accustomed to call traumatic neurasthenias. He emphasises the need for separating these psychically determined conditions from organic injuries of the nervous system, the difficulty of the task of distinguishing them being no mark of relationship between the two groups. He notes that the mass problem of the accident neuroses is a post-war phenomenon and, whilst attaching great importance to the influence of compensation, warns against the too easy explanation that the neurotic seizes upon an accident with the simple and conscious aim of obtaining that benefit. He explains that the economic position of the modern worker is insecure, and after an accident it is the threat not of personal injury but of economic disability that brings in its train an anxiety reaction about the future: if this is mishandled at its onset the self-preservation instincts replace ordinary judgments, the road to compensation shows itself, and there begins an interest in the demonstration of occupational unfitness. The need for early recognition and handling of these tendencies is obvious, and Dr. EYRICH believes it is a mistaken view of the situation that deduces a claim to compensation from the presence of nervous symptoms after an accident. The present-day attitude of the medical referee should be changed, for without the prospect of compensation a considerable reduction of these neuroses may be expected.

Anyone familiar with the hopeless wrecks who draw compensation for traumatic neurasthenia years after an accident in which physical injuries were negligible must grant some validity to Dr. EYRICH'S arguments and conclusions. These conditions arise when financial responsibility for an accident can be thrown upon someone else; they rarely occur when the victim must bear the brunt of it himself, and it is an old observation that traumatic neurasthenia never follows accidents in the hunting field. If compensation for these disorders could be stopped once and for all, then a great deal of mental deterioration with its associated suffering would be prevented. Probably, on balance, more benefit than injustice would result, but the situation is too complicated for such a simple remedy to be applicable, some of its complications being an inheritance from the days before mechanistic views had been modified by a knowledge of psychopathology. In our last issue, in the first of a series of lectures on that subject, Dr. E. G. HOWE showed the necessity of clearing away misleading labels, of which there is none more misleading than "traumatic neurasthenia." The conception involved is of an actual injury to the nervous system, and in this the patient and his friends firmly believe, effective treatment thus being made almost impossible. Worse than this, the conception is so widely held that he would be a brave witness who faced a jury and propounded the opinions enunciated by Dr. EYRICH, even though they might be in the best interest of the patient, who is usually quite honest in his declaration that he would prefer health to compensation. Another element in the situation is the common failure to diagnose the condition before it is well established, and for this we must blame the neglect of the subject in our curriculum.

Dr. EYRICH is partly right in his statement that the nature of the bodily or mental symptoms is immaterial to the general principle. Accident neuroses differ in no way from the minor psychoses that occur apart from accidents, except in the influence of compensation. They are rarely seen by the psychopathologist, but are sometimes found to be exacerbations of previously existing conditions or developments of an unchecked hysterical symptom that has passed into a state of severe anxiety. All types of people suffer from them, and the over-sensitive worrier, crying out for treatment he cannot obtain, is labelled "traumatic neurasthenia" in company with the slacker who is happy in his solution of the problem of how to live without work.

The occupational offer the same difficulties as the accident neuroses. The old conception of the occupational neuroses as an independent symptom bringing "neurasthenia" in its train, is giving way to the belief that the eponymous symptom is an excrescence upon an underlying mental state, its form being determined by the occupation. The disabling symptoms of miners' nystagmus, whatever may be the cause of the oscillation of the eyeballs, are predominantly those of the minor psychoses; compensation, in the absence of recognition of this fact, has been accompanied by a thirty-fold increase in cost in the last 20 years. In Belgium, with disability pay for a limited period, the disability rarely lasts beyond that period; in this country there is no limit to the one or the other and lifelong disability is not unknown. Yet the disability is real, and in a well-established case the irrevocable stoppage of disability pay would leave the patient in a parlous state and with little chance of recovery. The minor psychoses arise with and without compensation, and the present evil is that in the cases here discussed the sufferers receive, and are taught to look for, compensation rather than treatment. Thus the recommendations of Dr. EYRICH are an effort to retrace false steps that have led to disastrous results; yet the remedy is to be found in a fuller understanding of the nature of the conditions, and the handling of each case in the light of that understanding, rather than in a drastic reform that, whilst being the salvation of some people, may be an injustice to others.

[3] Guy's Hosp. Rep., 1930, lxxx., 407.
[4] Deut. med. Woch., Dec. 12th, 1930, p. 2129.

ANNOTATIONS

THE NEW YEAR HONOURS.

THE following is a list of the New Year Honours as far as they directly relate to the medical profession, issued after we had gone to press last week. No medical man has been raised to the House of Lords, but Sir John Rose Bradford, the President of the Royal College of Physicians of London, whose claim to distinction for his long and eminent services needs no emphasis, is created a Baronet.

K.C.B. (Military Division).

Lieut.-General Harold Ben Fawcus, C.M.G., D.S.O., K.H.P., Director-General, A.M.S.

C.B. (Military Division).

Major-General Lawrence Humphry, V.H.S., Deputy Director of Medical Services, Western Command, India.

C.H.

Miss Jane Harriet Walker, M.D., founder of the East Anglian Sanatorium, Nayland, and first President of the Medical Women's Federation.

C.I.E.

Lieut.-Colonel Hugh William Acton, I.M.S., Director of the School of Tropical Medicine and Hygiene, Calcutta.

Major Eric Edward Doyle, D.S.O., I.M.S., Inspector-General of Prisons, Bombay.

Lieut.-Colonel Ian MacPherson Macrae, O.B.E., I.M.S., Inspector-General of Prisons, Bihar and Orissa.

Lieut. Colonel Jasper Robert Joly Tyrrell, I.M.S., Chief Medical Officer in Central India.

K.C.V.O.

Ashley Watson Mackintosh, M.D., Honorary Physician to H.M. Household in Scotland; Emeritus Professor of Medicine in the University of Aberdeen.

M.V.O.

Marcus Antonius Johnston De Lavis-Trafford, O.B.E., M.D., Physician-in-Ordinary to the Duke of Connaught.

C.B.E.

Miss Louisa Martindale, M.D., J.P., President of the Medical Women's Federation.

Miss Agnes Catherine Scott, M.B., Chief Medical Officer and Secretary, Dufferin Funds.

Major Ernest Blechynden Waggett, D.S.O., M.B., Honorary Consultant in diseases of the throat, nose, and ear, Queen Alexandra Military Hospital.

O.B.E. (Civil Division).

Captain Hadji Dabiruddin Ahmad, I.A.R.O., Bengal Medical Service, Teacher of Anatomy, Campbell Medical School, Bengal.

Francis Edward Forward, F.R.C.S., Class I. Prison Medical Officer, Home Office.

Lieut.-Colonel John William McCoy, I.M.S. (retd.), Civil Surgeon and Superintendent of Jail, Sylhet, Assam.

Arthur Hutton McShine, M.D., nominated unofficial member of the Legislative Council of Trinidad and Tobago.

John Richard Cook Stephens, W.A.M.S., Medical Officer, Nigeria.

O.B.E. (Military Division).

Lieut.-Colonel Samuel George Steele Haughton, I.M.S., Officer Commanding Indian Military Hospital, Kohat, India.

M.B.E.

Homewell Lyngdoh, Assam Medical Service, Civil Surgeon, Nowgong, Assam.

Georges Alves Vincent, M.B., Medical Superintendent, St. Ann's Lunatic Asylum, Trinidad.

Knights Bachelor.

Ernest Gordon Graham-Little, M.D., for 15 years a member of the Senate of the University of London, whose work for the interest of the University is well known, is now the independent M.P. for the constituency.

James Smith Whitaker, M.D., is a senior medical officer of the Ministry of Health, a post to which he was appointed on the introduction of national insurance, having been previously medical secretary of the British Medical Association.

Ambrose Edgar Woodall, F.R.C.S., is the superintendent of the Manor House Hospital, Golders Green, and surgical specialist to the Ministry of Pensions.

Kaisar-i-Hind Medal (First Class).

Miss Mary Ronald Bisset, M.B., in charge of the Zenana Baptist Mission Hospital, Bhiwani, Punjab.

Graham Colville Ramsay, O.B.E., M.D., employed on malarial research work by the Ross Institute, Assam.

The following names will be recognised with pleasure in the list, as their owners in different capacities have worked in relation to medicine in one aspect or another. Sir Ernest Rutherford, who has been made a Peer, is chairman of the Advisory Council of the Committee of the Privy Council for Scientific and Industrial Research, and was recently President of the Royal Society. He is professor of experimental physics in the University of Cambridge, where his studies have revolutionised our conceptions of the universe. Dr. Frank Edward Smith, F.R.S., secretary of the Committee over which Sir Ernest Rutherford presides, has received a K.C.B. Mr. Arthur William Hill, F.R.S., director of the Royal Botanic Gardens, Kew, has been promoted K.C.M.G. The C.B.E. has been conferred upon Prof. Sidney Russ, professor of physics, whose work at the Middlesex Hospital in connexion with radium is familiar to all our readers. The O.B.E. has been conferred upon Mr. C. C. Ellis, Senior General Inspector of the Department of Health for Scotland, Captain W. M. Ablewhite, steward of Bethlem Royal Hospital, Mr. J. L. Worsfold, clerk to the Royal Hospitals of Bridewell and Bethlem, and Mr. P. L. Burnett, a devoted worker for the Seamen's Hospital Society. A similar honour is conferred upon Miss T. M. Morton, the organiser of children's care work under the London County Council, while the M.B.E. is received by Miss H. A. Alsop, lately matron, St. Mary Abbot's Hospital. The open-handed contributor to charity who concealed his identity under the pseudonym of "Audax" comes out into the open as Mr. George Roberts, and has been created a baronet.

THE MECHANISM OF SWALLOWING.

THE anatomist of old taught both the structure and the function of the organs and parts of the human body. When the study of function was taken from him by the physiologist, anatomy tended to become a dead science and physiology to go so far into the details of biochemistry and theory that it lost touch with the simple working of the parts. Between the anatomist and the physiologist the radiologist appears, to offer a living functional anatomy. No better example of his services could be offered than Dr. A. E. Barclay's study [1] of the mechanism of normal swallowing, which completely reverses the text-book accounts. What actually happens after the mouth is closed and the nose shut off by the soft palate is that the larynx is raised—as is well known—but its upper part is obliterated not by the epiglottis, which remains upright against the posterior pharyngeal wall, but by the mucous membrane of the laryngeal pharynx, jammed into place by the back of the tongue, which is "swallowed" as far down as the false vocal cords. The passage of the bolus of food is not a peristalsis or a piston stroke, but a suction. The laryngeal pharynx is pulled up behind the larynx towards the mouth as a tubular receptacle, which Dr. Barclay aptly likens to the open beak of the nestling pushed up out of the nest. The suction necessary to pull the bolus from

[1] Brit. Jour. Radiol., 1930, iii., 534.

the tongue into the laryngeal pharynx is obtained by a momentary obliteration of the pharynx. For just about one-twentieth of a second before the food passes over it, the pharynx is turned into a potential space, being pushed against the vertebral column behind it by the upward movement of the larynx and the pressure of the back of the tongue in the upper part of the larynx. After this obliteration a negative pressure is, of course, present, and the food falls down the laryngeal pharynx in the shape of a drop with a rounded lower border and a long drawn-out tail like a comet. As soon as the laryngeal pharynx receives the bolus it drops back into its normal position and so opens up the larynx. The suction effect probably lasts until the food reaches the junction of the upper and middle thirds of the œsophagus. Here suggestions of peristalsis are seen on the screen; here the muscle changes from voluntary to involuntary; here the nerve-supply alters; here the muscularis mucosæ becomes increasingly prominent, and here middle-sized foreign bodies almost always stick. Gravity seems to play no part in the passage of the food, for a man can swallow in any position.

These observations raise many questions which Dr. Barclay fully appreciates. Nevertheless, as he says, the radiologist can only record observed facts and leave it to others to complete his story.

MALARIA IN DRUG ADDICTS.

THE therapeutic inoculation of malaria in general paralysis and allied conditions has shown the readiness of the subtertian (or malignant) malaria parasite to multiply in the unprotected human body and produce virulent and rapidly fatal forms of the disease. Sometimes inoculation has been accidental. Thus, C. M. Wenyon [1] relates that a number of men were unwittingly infected during salvarsan injections. Though a sterile needle was used for each man, the tubing and glass window were not disinfected between injections, and infected blood corpuscles were thus inoculated into ten successive men, producing attacks of malignant tertian malaria which were fatal in some of the cases. Major A. G. Biggam,[2] professor of clinical medicine in the Egyptian University, Cairo, finds that similar severe and often fatal infections arise from intravenous administration of heroin by depraved addicts in Egypt. The drug is obtained almost exclusively in the Bulac District of Cairo and is administered by a gang quite without any special medical knowledge. The solution of heroin is made up in bulk and administered by syringing, blood being drawn up into the syringe before making each injection so as to ensure that the needle is in position. No sterilisation of the needle is attempted between the injections. The appearance of the veins is characteristic; in some cases there are scars along the superficial veins of the forearm, with dark pigmentation resulting from repeated punctures. Some cases in hospital give a history of as many as three injections in a day. In no other country, Major Biggam thinks, is heroin taken intravenously by drug addicts, and it is probably the success of intravenous injection of tartar emetic in schistosomiasis that has popularised this method of medication in Egypt. By the time they reach hospital most of the addicts are in a wretched condition, very emaciated and mentally unstable. During April, 1929, some of them showed irregular temperatures, and on further investigation, it was discovered that they had a very heavy infection of crescents, or sometimes rings, of the subtertian parasite, which probably accounted for their dysenteric symptoms. In one case subtertian crescents were demonstrated in scrapings from the sigmoid colon. The patients with subtertian malaria were all inhabitants of Cairo where subtertian malaria as a natural infection is unknown. Two possible explanations of this infection are possible: either the heroin lowered their resistance and so made them more susceptible to the bites of infected mosquitoes, or malaria was transmitted to them during the process of injection. The second explanation is by far the most probable. The syringes seized by the police were examined by Dr. A. L. Urquhart, professor of pathology, but though all were found to contain various amounts of decomposing blood clot, no malaria parasites could be demonstrated in this unpromising material. Major Biggam gives details of ten cases, one of which was fatal.

[1] Protozoology, London, 1926, vol. ii., p. 955.
[2] Trans. Roy. Soc. Trop. Med. and Hyg., 1929, xxiii., 147.

AN INQUIRY INTO THE CAUSES OF MENTAL DEFICIENCY.

FOR some time the Royal Eastern Counties' Institution for the Mentally Defective, at Colchester, has been desirous of making an inquiry into the causation of mental deficiency. This interest was stimulated, perhaps even initiated, by the generous gift of Lady and Miss Darwin, who founded the Darwin Trust and endowed it with an income of about £275 a year. The possibility of research was ensured when the Medical Research Council agreed to contribute nearly half of the salaries and expenses of a full-time research medical officer and a social investigator. These appointments have now been made and work will begin this month. The officer is Dr. Lionel S. Penrose, lately research student at the Cardiff City Mental Hospital, and the investigator is Miss Newlyn, who has been working for the last six years with the Devonshire Voluntary Association for Mental Welfare. The first piece of research is to be a minute inquiry into the physical and mental characteristics, the home environment, and the family histories of the 1400 patients in the Colchester institution.

HYGIENE IN PRIVATE SCHOOLS.

THE President of the Board of Education recently announced the appointment of a departmental committee to consider the relation of education authorities to schools not in receipt of grants from public funds, and what legislative or other changes are desirable in order to secure for the children attending them an adequate education under suitable conditions. The last three words emphasise the importance of the inquiry from a medical standpoint, and the committee includes the names of two medical men—Dr. O. M. Holden, medical officer of health for Croydon, and Dr. Alfred Salter, M.P. The position as it stands is admittedly unsatisfactory, for there are private schools inefficient on the scholastic side, housed in defective buildings, and devoid of medical supervision. To make matters worse, some of the children attending them have been deemed unfit, by reason of mental or physical defect, to attend ordinary elementary schools, and therefore need special care. In practice, all that the local education authority can do is to prosecute the parents for not giving their children an efficient education—a procedure adopted only in extreme cases or where the premises

are utterly unfit. But the term "schools not in receipt of grants from public funds" is so wide as to include our public schools, which have their own zealous medical officers, who have an association where the doctors of great public schools discuss matters of common interest with medical officers of elementary schools. Leaving aside such great institutions, it may be said that private schools in general suffer by comparison with State-aided schools in three ways: (1) the buildings may have sanitary defects, and are subject to no special medical inspection; (2) there is no school medical inspection of the children; (3) there is no scheme of treatment and none of the facilities for dealing with exceptional children that are provided by most public education authorities. Further, the teachers in private schools have rarely had the specialised training, including a knowledge of child psychology and hygiene, which come into the curriculum of the training colleges for teachers in elementary schools. Now the buildings could be subjected to inspection by the officers of the school medical service in coöperation with those of the public health authority. In the better private schools medical inspection is being more and more adopted by individual schemes, and in cases where nothing of the kind is contemplated it might be necessary to insist upon its establishment as an alternative to the work being done by the school medical service of the local authority. In some cases it might be convenient to afford children of private schools the facilities for treatment and special care maintained by the local authority, but for the most part the parents would no doubt prefer to arrange privately for medical and convalescent care. Even so the private schools would remain at a slight disadvantage, but not such as to inflict serious injury on the children. It is a matter of experience that the introduction of the doctor into a school, whether officially or by private arrangement, has a beneficial influence on the mental as well as the physical atmosphere of school life.

THE ANATOMY OF LEONARDO.

Leonardo da Vinci, painter, sculptor, architect, engineer and anatomist, occupies a commanding place in the world's history, but while his pre-eminence is unquestioned in so many directions, his achievements as anatomist have often been the subject of discussion, how far he was wholly original and how far he derived from previous knowledge being matters not easy to settle. The vicissitudes of his vast stores of notebooks and sketches, recording his multifarious studies form an interesting story which Prof. McMurrich [1] has set out now in a fascinating work on the master as an anatomist. A critical estimate of Leonardo's place on the roll of fame is directed towards his position as a pioneer, but a historical background is supplied with learning and discrimination, so that the part played by Leonardo in that period of intellectual awakening which he adorned becomes defined. As all his manuscripts dealing with anatomy are now accessible in facsimile, the personal achievements can be compared with those of his successors. There is no call, it seems, to check Leonardo's work as an anatomist with those who preceded him, for his dependence upon Avicenna and Mondino is unconcealed. But how far certain of those who followed Leonardo, notably the great Vesalius, derived help through access to Leonardo's notes, forgetting to acknowledge the inspiration, may not be wholly settled. On the other hand, certain of the claims made in Leonardo's behalf in respect of priority, or of actual authorship, cannot be substantiated. Prof. McMurrich, while sharing the admiration of the world for Leonardo's genius, is no indiscriminate eulogist; on the contrary, he brings out clearly the inconsistencies and errors which are revealed in his scientific work, and which are explained by the position of knowledge in the fifteenth century, when the new learning was barely emancipating itself from the grip of tradition. After a review of the position of anatomical knowledge during the long and sterile period between Galen and Leonardo, and an inquiry into the possible literary sources of Leonardo's anatomical knowledge, we have a series of chapters in which Leonardo's special researches into the anatomy of the various systems are set out. These chapters are in many instances beautifully illustrated, and especially is that the case in the interesting sections dealing with the heart and blood vessels. The main part of Leonardo's knowledge was derived from the autopsies which he conducted, and the pictures, not only in their charm but in their accuracy, show a wonderful advance on any anatomical drawings that had been made previously. At the same time they illustrate very well the preponderating force of tradition as, side by side with exquisite representations of what he must actually have seen, we have drawings perpetuating old theories, the errors apparently being introduced in support of theories themselves erroneous.

This is a loving study, and it is not surprising to learn that Prof. McMurrich found its production to be a heavy toll for some years upon all the time that he could spare from his duties at the University of Toronto. The volume is produced at the instance of the Carnegie Institution of Washington.

[1] Leonardo da Vinci, the Anatomist. By J. Playfair McMurrich. London: Baillière, Tindall and Cox. 1930. Pp. 265 + xx. Price £1 7s.

HUMANE SLAUGHTER.

In a recent Chadwick lecture, arranged by the Model Abattoir Society, Sir James Douglas dealt with the humanitarian clauses of the model by-laws issued, in 1915, largely as a result of the evidence brought before the Admiralty Committee on humane slaughtering of animals shortly before. These by-laws, which replaced the revision of 1909 and are probably not as well known as they should be, run thus:

"Every person engaged in a slaughter-house in driving or bringing any animal to the place of slaughter shall (*a*) avoid, as far as practicable, driving or bringing the animal over any ground which is likely to cause the animal to slip or fall and (*b*) otherwise adopt such methods and precautions as will prevent the infliction upon the animal of unnecessary suffering or pain. A person shall not, in a slaughter-house (1) slaughter or cause to be slaughtered any animal, or dress or cause to be dressed the carcase of any animal, in the view of another animal.

"An occupier of a slaughter-house shall not cause or allow any blood or other refuse to flow from the slaughter-house so as to be within the sight or (so far as it is practicable to avoid it) within the smell of any animal in the slaughter-house and he shall not cause or allow any blood or other refuse to be deposited in the waiting pens or lairs."

There is also a clause in the Protection of Animals Act (1911) which runs:

"Nothing in this section shall render illegal any act lawfully done under the Cruelty to Animals Act, 1876, or shall apply—

(*a*) to the commission or omission of any act in the course of the destruction, or the preparation for destruction, of any animal as food for mankind unless such destruction or

such preparation was accompanied by the infliction of unnecessary suffering . . . ."

and when interpreted in relation to its context means that no one must inflict unnecessary suffering on a food animal about to be slaughtered either before or during the act of slaughtering.

The Royal Society for the Prevention of Cruelty to Animals, with the help of their honorary adviser, Mr. R. O. P. Paddison, have been publishing what they regard to be the most humane way of killing. For each type of animal a different method is applicable. For beasts the most humane method is the use of the stunning-pen. In the majority of slaughter-houses the animal is led in on a halter or is drawn in by means of a rope passing through a ring fastened to the wall or a beam of the slaughter-house. This is not the best way; for if the beasts see ahead of them daylight or anything white, such as a whitewashed wall, they will walk quietly along a narrow passage into a pen where they may be stunned by mechanically operated instruments. The stunning-pen is a four-sided structure with high wooden sides too high for the animal to look over and a door which can be closed on the animal; the operator leans over the side of the pen. Directly the animal drops, a lever is pulled and the animal rolls out of the side of the pen, the floor lifting at the side opposite the opening. Once outside, it is bled. No blood, therefore, is present in the pen; the animal neither sees nor smells blood nor does it see any carcasses. Such a pen costs about £75, and it would be desirable to introduce one into the plan of every new slaughter-house to be erected. But existing slaughter-houses could be more cheaply altered to allow of more humane methods of bringing in beasts. The passage should be so wide at its entrance that the animal does not mind going in, and no animal should have to be turned round after reaching the slaughter-house. Flooring is of importance; at present concrete floors with ridges are in use, but these ridges wear down and are not renewed. It is not only the animals which dislike slipping about. Prof. Linton is experimenting with a layer of carborundum, ¼ inch thick, on a concrete basis. Progress, too, has been made in making the throwing of beasts more humane; the Islington Board of Schechita has decided to use the newly perfected form of the Weinberg casting machine at the City of London Slaughter-houses where some 30,000 to 40,000 beasts are slaughtered every year.

To kill pigs humanely a suitable pig-trap should be used. The R.S.P.C.A. recommend the Barrett-Smith or the closely similar Schermer type. In both the pig is walked from its waiting pen up a narrow run into the trap which has sloping sides and a floor made to sink. Thus caught the pig is stunned with a humane killer and bled after rolling out of the uplifted side of the trap. The usual way of steadying the pig by means of a loose rope over the upper jaw while he is shot may involve some dragging about. Better, but not so good as the trap, is for an expert slaughterman to walk into a pen full of pigs and shoot one after another, which he can do without causing them any obvious psychical distress. In the case of sheep we find perhaps the most urgent need for the application of the general aim that the waiting pen should be as close as possible to the spot chosen for slaughtering. Many of the ways of handling sheep are far from humane, but the following is unobjectionable. A sheep is brought in either by leading or lifting and placed gently on a crutch (a kind of cradle); the animal is then held in position by a helper and killed by sticking or by a humane killer. A better plan, which enables the operator to work quite alone, is for the slaughterer to bring in the sheep, to lay it gently on the crutch and to pass a strap over its body, one end being fixed to one side of the crutch and the other end attached to a handle at the opposite side. Calves are usually hoisted by a rope attached to both hind legs, and then slaughtered by sticking through the vessels of the neck and by pithing. A better plan is first to stun the animal with a humane killer and then to hoist and bleed.

MENTAL AFTER-CARE.

TO-DAY there is much talk of mental pre-care and mental after-care but, as Dr. G. W. James reminded the recent conference on mental welfare, this country has had a mental after-care organisation for over 50 years, and a very fine work it has carried on all that time. Without it many discharged patients would have been lost indeed. Dr. James told the story of the carpenter who came home to find that his precious bag of tools, his only hope of livelihood and return to normal work, had been pawned during his absence; and of the young man found wandering in the streets of Cardiff, having no memory of what had happened to him since he started out on an errand in an American city months before. Many patients can be released from mental institutions before they are ready for the stress of home life; for these the Association arranges convalescent care in cottage homes. For others it finds work—often no easy matter, for suspicion of the ex-mental patient dies hard among employers—or clothing, or provides a sympathetic friend whose interest will make bearable an otherwise intolerable or lonely environment. It is distressing to hear that the Association is in sore need of funds to carry on this work. Over 2000 cases were helped last year and the certified administrative expenses were less than 8 per cent. Applications for aid are becoming ever more pressing and more numerous. It is to be hoped that the appeal for funds will meet an immediate and generous response. The secretary is Miss E. D Vickers, Church House, Westminster, S.W. 1.

THE VITAMIN CONTENT OF COD-LIVER OILS.

THE latest publication of the Empire Marketing Board is a report[1] in reply to a recommendation from the Imperial Economic Committee (contained in a report dealing with our fish supply) that the nature of the variations in the vitamin content of cod-liver oils produced by fish from various sources should be the subject of inquiry. The underlying causes of such variations were subjected to research, and the methods of manufacture were studied, as well as the refining of the oil for medicinal purposes. Dr. Drummond Shiels, Chairman of the Research Grants Committee, in a prefatory note says that the research work carried out has demonstrated beyond doubt the unrivalled medicinal value of the oils produced in Scotland and Newfoundland, which view makes good patriotic reading, expressed in a rather unusual place. The conclusions of the report have been published for consideration, and it is unfair to the well-known experts to make their results depend, for public estimate, upon a preface. But the general findings of the investigators support the belief that the vitamin value of the oil yielded

[1] The Relative Value of Cod-liver Oils from Various Sources. By Prof. J. C. Drummond, D.Sc., and Prof. T. P. Hilditch, D.Sc. 1930. H.M. Stationery Office. 1s. net.

by the cod caught in Newfoundland waters is the highest, next in order of merit coming the oils of Icelandic and Scottish origin, those from Norway being the least potent. The colorimetric experiments, however, which support this view are not accepted everywhere. The report deserves careful study; the stages of the investigation are clearly set out, and the reasons for the expressed opinions can be readily grasped, while references are given to discussions upon the relative values of the different oils from which opposing views can be ascertained. The general scheme of the experimental observations undertaken in collecting material for the report is an impartial one and the methods for the assay of vitamin potency were carried out with rigid biological tests. In other sections the technical production of cod-liver oil is set out, the report closing with notes on cod-liver oil for human use and animal food.

THE MEANING OF SACRIFICE.

THE wide spread of identical rites and customs for which no rational explanation can easily be given can be considered as the result of diffusion from some common centre or as separate developments of innate human tendencies. The second view is adopted by psycho-analysts, though disputed by some anthropologists, and Freud himself has accounted for the customs of totemism and taboo as derivatives of the primitive œdipus situation. In a thesis recently published [1] Dr. Money-Kyrle brings together descriptions of various rites of sacrifice as gleaned from classical mythology and accounts of primitive peoples, with a critical examination of previous anthropological theories, which attempted to reconstruct the conscious purpose that might have originally provoked those rites. He then attempts to reconstruct the unconscious purpose, and, granted the psycho-analytical premises that he lays down in the first part of the book, he has succeeded in giving to these strange practices a meaning that forms a consistent general picture. The book does not stand alone but represents a recognised mode of approach to anthropological problems; it can be read, however, as a self-contained unit, since the author makes clear those principles upon which his reconstructions are founded. Frazer's "Golden Bough," upon which he freely draws, will long remain our chief storehouse of knowledge of ancient and primitive rites; the interest originally aroused by Frazer's attempt to deduce from them a history of the human mind should receive a stimulus from this application of new views to an old problem.

SODIUM AMYTAL DURING LABOUR.

THE continuing desire for a safe and easily administered anæsthetic that could be widely used to ensure painless confinements has led to the trial of intravenous sodium amytal for the purpose. The results of 46 administrations are carefully recorded,[2] and one gets a clear impression that the desired anæsthetic is still to seek. Although in no instance was the labour prolonged or the mother's physical condition unfavourably affected, yet 11 patients showed extreme restlessness soon after administration of the drug, and restraint became necessary. One patient became maniacal. In all but six of the patients some inhalation anæsthetic was needed at the time of delivery or towards the end of the second stage. One-third of the babies were somewhat apnœic at birth; their condition was "apparently due to a torpidity of the respiratory centre, induced by the drug, and required stimulation to establish respiration." The conclusion is reached that the intravenous administration of sodium amytal during the latter half of the first stage and during the second stage of normal labour induces satisfactory amnesia in nine out of ten cases.

On p. 74 of our present issue we publish a report on basal hypnosis with nembutal, which is another of the barbiturate derivatives.

[1] The Meaning of Sacrifice. By R. Money-Kyrle, M.A., Ph.D. London: The Hogarth Press. 1930. Pp. 273. 18s.
[2] Swendson, J. J.: Minnesota Med., December, 1930, p. 868.

DECLINED.

A DAILY paper commented recently upon the fact that Mr. Alasdair Alpin Macgregor had received from Major A. G. Church a refusal to Mr. Macgregor's request for an opportunity to debate in a public hall the terms of a speech made by Major Church in Parliament. The speech in question was made in opposition to Lieut.-Commander Kenworthy's motion for leave to bring in a Bill to prevent the application of public money to vivisection experiments. The gist of Major Church's speech will be found in our columns (1930, ii., 1430), and the House refused leave to bring in the Bill. As Mr. Macgregor, in his invitation to a public debate, described Major Church as having spoken in the House "on behalf of the British Medical Association and its vested interests," being either ignorant of his appointment to the Medical Research Council or believing that the latter body and the B.M.A. were identical, it probably seemed to Major Church that this suggested debate would not take place in the presence of an unbiased audience. Such a conclusion was quite justifiable, and upon it the refusal to talk publicly to Mr. Macgregor followed naturally.

Dr. David Shannon will preside over the eighth British Congress of Obstetrics and Gynæcology, which meets at Glasgow from April 22nd to 24th. The first day's discussion will be devoted to the clinical and pathological features of ovarian tumours (excluding endometriomata). The hon. secretaries are Prof. James Hendry, 7 Clairmont-gardens, Glasgow, C.3, and Dr. John Hewitt, 16, Whitehill-street, Glasgow, E.1.

INDEX TO "THE LANCET," VOL. II., 1930.

THE Index and Title-page to Vol. II., 1930, which was completed with the issue of Dec. 27th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

MANCHESTER VOLUNTARY HOSPITALS' COMMITTEE. The annual report shows that the total ordinary income for last year was £307,703, compared with £286,904 in 1928. The total ordinary expenditure was £323,984, compared with £315,615 in the previous year. The net deficit for the year is £12,430 less than that of 1928. The net increase in ordinary income is £20,799, and the increase in expenditure is £8369. The number of admissions to the hospitals was 730 more than in 1928.

A POST-GRADUATE COURSE

MOTIVES AND MECHANISMS OF THE MIND.*

II.—DYNAMIC PSYCHOLOGY.

THE CONCEPTION OF "PURPOSE" APPLIED TO PHYSICAL ORGANS IN HEALTH AND DISEASE.

IN the previous lecture a distinction was made between those mental disorders in which the disorder was resultant, and those in which the disorder possessed a "function" or element of purpose. This conception of *purpose* in the ætiology of disorder may be traced both in health and disease in organic medicine, and is not only of importance in psychopathology.

The ordered development and specialisation of function of the physical organs of the body may be considered as being *purposive*—for example, the purpose of the alimentary canal is digestion, assimilation, and elimination; and the purpose of the central nervous system is selection, inhibition, and control. The organisation of the body as a whole depends upon a working in harmony of its various functions, a coördination of the purpose of each unit system into a single team, working in harmony under the control of the central nervous system. The purpose of the whole unified system is to produce greater order, freedom, and power over the external environment in which the system lives.

A further instance of purposive behaviour in organic medicine is found in the behaviour of the organs in states of disordered function—i.e., disease. Let us consider, for example, the changes which take place with the introduction of a foreign body into the tissues, and the development of *inflammation*. The introduction of a septic body into the finger gives rise to the cardinal signs of inflammation—swelling, heat, redness, and pain. From one point of view the signs and symptoms of inflammation are regarded as being something undesirable which requires immediate remedy, but when considered in detail the disorder is seen to consist of a series of related purposive interactions on the part of the tissues involved. The introduction of the foreign body causes a reaction on the part of the tissues, the purpose of which is to expel it. The leucocytosis is a massing of phagocytic cells, the purpose of which is to remove the undesirable foreign body. The heat, pain, redness, and swelling are all consequent upon this purposive activity, the increase in temperature of the part being also probably purposive in assisting the remedial process. It is as if the tissues are prepared for the invader with a fixed type of defensive reaction. It cannot be said that there is any *consciousness* of purpose in this response, but it is very important to realise that *consciousness is not necessary for behaviour to be purposive.*

Another example of purpose in organic medicine is found in vomiting. The symptom, when it occurs, is subjectively very undesirable, and the patient applies for a remedy, not realising that the vomiting is itself a remedy for a previous state of disorder. The purpose of vomiting is, again, the removal of a noxious foreign body, to the stimulus of which the muscular part of the stomach reacts with an expulsive impulse.

Nevertheless, the patient is usually quite right in regarding vomiting as needing a remedy. At this stage it is necessary to recognise that, wonderful as are the purposive defensive mechanisms in the human body, these may, and very frequently do, require medical remedy before the system can return to an ordered state of health. It is very important to recognise, on the one hand, the natural purposive remedial aspect of the human body in a state of disease. It is as important to recognise, on the other hand, that this remedial function may itself call for treatment, it being unable to deal effectively with the disorder without medical aid. This point will be returned to when we consider purposive behaviour on a higher plane than that of organic function.

NON-PURPOSIVE OR "RESULTANT" ORGANIC BEHAVIOUR.

A little consideration will show that by no means all organic behaviour can be regarded as purposive. Take, for example, the familiar symptom of *tremor*, which is one of the commonest signs of a disordered nervous system. This is consequent upon a disordered state having arisen in the nervous unit. The process of inhibition, which normally maintains a controlled and ordered tone throughout the nervous system, is broken down in its higher organisation, due, perhaps, to exhaustion or toxæmia, and the symptom of tremor is *resultant* without being remedial or purposive.

A second example of a resultant, non-purposive symptom is the muscular paralysis found in Bell's palsy, where the seventh nerve has been put out of action from some cause. A ptosis of the eyelid due to conjunctivitis may be considered as purposive, but if it is due to nerve paralysis it is resultant and non-purposive.

Another example of non-purposive behaviour is to be found in the development of neoplastic growths. A neoplasm is an independent extension of cells in a parasitic and independent way, at the expense of the normal function of the invaded organ. It is not purposive, and surgical remedies are usually required to protect the body as a whole from the disordered activities of neoplastic cells.

THE IMPORTANCE OF DISTINGUISHING BETWEEN PURPOSIVE AND NON-PURPOSIVE DISORDERS.

It is not many years since the greater part of medical treatment was directed towards the remedy of symptoms and there is still too often a tendency to resort to symptomatic measures. The universal remedy for a headache is aspirin without reference in most cases to the underlying cause. A patient who suffers from insomnia is given hypnotics, or if it be "nerves" he is given either sedatives or tonics. But symptomatic treatment ignores the cause of the disorder, and in many cases must leave it still uncured.

The distinction which has been drawn between purposive and non-purposive or resultant symptoms provides the clue to those cases which may be treated symptomatically and those which require deeper insight into the underlying cause. Disorders which belong to the resultant or non-purposive group may, if necessary, be treated individually and

* A course of 12 lectures delivered under the auspices of the Tavistock Clinic, Tavistock-square, by Dr. E. Graham Howe during the autumn session of 1930. Lecture I. appeared last week.

symptomatically. Those which are purposive must be treated by a method which seeks to define and remove the cause.

In no field of the physician's responsibility has the use of remedies been more symptomatic than in that of mental disorder. Mental disorder differs from organic in that it is more frequently purposive than resultant. The same rule of treatment applies. In order to get the best result from treatment of mental disorder we must define and remove the cause before we can expect to effect a remedy.

In the previous lecture examples were given of enuresis and insomnia in which the disorder was primarily purposive and which cannot, therefore, be expected to respond to symptomatic treatment.

Intractable Illness.

Every doctor is familiar with the disheartening experience of intractable cases of illness which he feels ought to respond to simple remedies, but which, in fact, seem beyond his power to cure. Such patients usually complain of many symptoms which they describe in fullest detail, even with great satisfaction. If a symptom of headache has been improved, pain in the shoulder has taken its place; if the patient is sleeping better, then he is less able to do his work owing to vague feelings of illness or excessive fatigue. Very often such patients in their anxiety to be cured have gone so far as to write down for the doctor a list of their complaints, and successive visits will find modifications in the list, but additions to the number of complaints rather than any sign of cure. They go from one doctor to another, and sometimes their doctor is not sorry to see them go.

If a patient were getting anything out of his illness, if the illness were *purposive*, the intractability could easily be appreciated.

It is quite obvious on a little consideration that illness does achieve a purpose. We are probably all familiar with the feeling that we should like a few days in bed, with someone to be kind to us and give us special attention. Such a rest from the cares and responsibilities of everyday life would come as a welcome relief, but only for a while to most of us. However, the fact remains that a little illness can be attractive under certain conditions. Illness may be still more useful; in fact, it may become invaluable under certain conditions as the following case will show.

Every child wants to be the centre of attention and to exercise some degree of authority. A child of 3 finds his small world enlarged by the introduction into it of a baby brother and, at a single blow, he finds that he has lost both his position in the centre of the domestic stage and his unique dominance over his parents. No one, after having been number one, likes to be relegated to the position of "also ran." An illness causes the displaced one for the time being to recover his position of authority. He is again the centre of the stage, again the one whose slightest whim is met with pleasure and approval. His illness is useful and if his power of adaptability is lacking, if his will to be really strong is not keen, from this early useful experience may be developed the lifelong tendency to invalidism. His illness will be intractable because it is purposive.

CASE H.—A boy of 17 was working in a machine shop at a task he heartily disliked. His father, who was also the foreman, he disliked as heartily as the job. His best friend caught his finger in some machinery and was away from work for three months with compensation. The boy expressed a wish to be ill in order that he also might be able to stay away from work. He got the worst of an argument at home with his father and went to the pictures, where he saw a film of a popular hero who lost his sight, but was married nevertheless to the most attractive heroine, who mothered him happily for the rest of his life. The following day the boy complained of failing eyesight which rapidly developed until he was almost blind. The patient was referred from the eye hospital as a case of conversion hysteria, which was confirmed by the history and circumstances of his illness. He might have been a case of conversion hysteria. His condition seemed at first to improve under hypnotic suggestion, but after a month's unsuccessful treatment he was referred back to the eye hospital where it was discovered that he had bilateral optic neuritis.

Such are the difficulties of diagnosis. Everything was suggestive of a purposive symptom, but it was in fact not purposive, but resultant.

The shell-shock cases of the war provided many instances of purposive disorder which were, nevertheless, quite distinct from the numerous other cases of malingering, with which they were sometimes confused. The man who could face the fact that he felt afraid was not subject to conversion hysteria. The man who could not face the fact, but who had to adapt himself somehow to a situation in which he felt miserably inadequate, was subject to the possible development of conversion symptoms, the purpose of which was to solve his problem for him in a way which was beyond his control. From these causes were developed the cases of blindness, paralysis, fits, aphasia, and innumerable other symptoms—all of which were effective in removing the sufferer from an intolerable situation.

In the case of the malingerer the problem was a conscious one—consciously attempted, consciously achieved. In the true case of shell-shock the problem was not conscious, but was achieved through the natural unconscious method of conversion hysteria, over which he had no conscious control.

Cases of "traumatic neurasthenia" come frequently into the hands of the general practitioner and are always regarded as a difficult problem. They are frequently complicated by the question of compensation. These, again, provide a simple example of a purposive disorder, in which the illness is being useful. It is only natural if there is any question of compensation that the patient should wish it to be as much as possible. He need not consciously think so, but the amount of compensation is going to depend upon the degree of his disability and the tendency is therefore for his disability to be increased. Such cases tend to clear up with greater facility when the compensation is settled. It is easy to suspect a patient of malingering, of consciously exaggerating his disability, but this is not necessarily the case at all. The mechanism for what is called "conversion hysteria" is there, which makes use of the opportunity provided by the disability, quite independently of consciousness. The strain of work under conditions of economic pressure and the everyday difficulties of life are often sufficient in any case to exaggerate the symptoms of illness as a defence, without any question of compensation.

WHAT DO WE "NEED" FOR ADAPTATION?

If disorder is so often purposive, what purpose is it trying to achieve? In other words, what are the needs which all of us tend to feel as essentially requiring fulfilment? They are essentially three: (1) love—a feeling of priority; (2) protection—a feeling of security; (3) power—a feeling of control. Consideration of all the cases already mentioned will show the degree of satisfaction along these three lines which have been attained through illness. The purpose of the disability has been to achieve what the

patient wanted or needed, whether he was conscious of it or not. The illness was a means to an end, and the end was love, protection, power—any or all. *It is therefore not true to say that the patient wants his illness, as such.* He does not want it as an end in itself, but he does want it as *a means to an end.* He wants what he gets out of the illness and not, as a rule, any particular symptom. The patient is quite right in saying that he does not want to be ill, and in repeating that he wants to be cured. Furthermore, the patient does not know what he does want. He is not conscious of his need, but love, protection, and power are goals which human nature is pre-ordained to pursue and find attractive.

The child makes use of the thunderstorm or enuresis as a way to finding love and protection in the mother. In the cases of insomnia mentioned in the previous lecture, the symptom was regarded as intolerable, but the purpose of it was to be found in satisfaction of the need for love, protection, and power.

Conflict.

Why should it be necessary to develop a symptom which is itself undesirable, in order to obtain a goal which is desirable? The answer to this question introduces the conception of *conflict.*

There are sometimes reasons why the goal, besides being desired, should be undesirable because it is feared and in those cases a *wish not to* is opposed to the primary goal-seeking wish. Life possesses a primary polarity between the impulse towards inertia and the impulse towards growth. On the one hand there is a wish to retreat, or at least to maintain the status quo. On the other hand, there is the wish to grow beyond the limits of our present experience towards the attainment of higher things. Here, then, is a possible basis for all conflict. But there are other causes for our frequent experience of a duality of opposing wishes.

The importance, at any given time, of previous experience in evaluating the present circumstances is a matter which will be more fully developed in succeeding lectures, but beneath the surface of the man of any age there is always a foundation of previous experience during his own childhood and the childhood of the race. All our wishes are not socially tolerable, nor even consciously acceptable. Social adaptability is a comparatively late development and is superimposed upon primitive childish egotism. This second aspect of conflict is due to the difference between the past and the present, the old and the new, the primitive and the civilised, the child and the man. The wishes and feelings of the one are not tolerable to the wishes and feelings of the other.

Then there is the conflict between the heart and the head, between "feelings" and "thoughts." There are many things that we feel that we would like to do, that we know we must not do, and our heads are frequently in conflict with our hearts. The most important point to recognise, however, is that our heads are frequently unconscious of the wishes or tendencies of our feelings. The cases which have already been cited were not cases of conscious conflict, but of unconscious conflict. The patients do not know what they feel or what they want, nor even that they are getting what they want. We do not realise the extent to which our behaviour is motivated by unconscious processes. On the physical plane inflammation is a purposive unconscious process; on the emotional plane conversion hysteria is another example of a similar purposive unconscious process.

Conflict therefore may be between unconscious feelings and tendencies and conscious wishes. On the one hand there is "I feel I want"; on the other "I think I ought." That often I am not conscious of what "I feel I want" is due to the fact that so many primitive childish "wishes" are a hereditary pattern independent of individual experience. This point will be developed further in a later lecture.

CONSCIOUS CONFLICTS—SUPPRESSION.

If we were to judge from the report of coroners' inquests we should have to believe that conscious conflict was the cause of mental illness. Cases of suicide are usually related to some immediate problem which is consciously in the patient's mind—i.e., disappointment in love, financial anxiety, worry over illness. It is obvious that any of these factors may impose an additional strain, but they are all external factors operating upon the patient's internal psychological constitution, and it is the internal constitution which determines whether or not illness or suicide or any other pathological behaviour may follow. As an axiom it may be stated that conscious conflict cannot, in itself, *cause* an illness, but it may be sufficient to *precipitate* it.

Overwork is frequently cited as a cause of nervous breakdown. The additional strain imposed by long hours, heavy responsibility, and possible financial disappointment is an added burden, which may result in a nervous breakdown, without being the cause of it. For instance, we may ask *why did the patient overwork?* In many cases it will be found that he was trying to do more than anyone would have expected him to be able to do, that he was more critical of himself than he had any right to be, that he was more intolerant of failure and unduly anxious for complete security. With these factors operating he must inevitably tend to overwork and must also finally be disappointed with his achievement. In other words, overwork often depends not upon the external factor of necessity, but upon the internal constitutional factor which would make a patient overwork anyhow, whether it was necessary or not. In this case it may be said that overwork has precipitated the illness, but that the cause lay within the individual's constitution rather than in external circumstances.

CASE I.—A man came for a consultation complaining that he was worried, depressed, and losing his sleep. On inquiry he was found to possess two wives and two families who were ignorant of each other's existence, and at the same time he was a responsible church-worker. When one considers the difficulty of maintaining his social prestige and his domestic problems in watertight compartments, together with the pressure of economic necessity, there need be no surprise at signs of nervous strain. There must have been a great deal of conscious conflict, but there was probably an internal and unconscious motive which prompted him to organise his life in such a difficult fashion.

Conscious conflict may be dealt with by a process of *suppression.* When I am aware that I want two different things I weigh one against the other, and choose the one and suppress the other. This is a conscious process of selection in which one alternative is suppressed in favour of another, and is not to be confused with *repression* which is an unconscious and automatic process.

UNCONSCIOUS CONFLICT—REPRESSION.

It is very difficult to formulate at this stage any ideas which will define unconscious conflict, but the conception will be developed in later lectures. It will be sufficient for the moment to define unconscious conflict as being derived from a source of unresolved

past wishes and needs, primitive and infantile. Unconscious wishes have either never entered consciousness or, originating at an earlier stage of development, are not consciously tolerable when they have been retained until a later one.

Childish wishes are very often not consciously tolerable. For instance, a small girl, aged 3, may say to her mother: "When are you going away so that I can go to bed with Daddy?" It is not long before wishes of this kind are dealt with by *repression*. This is an unconscious automatic process which eliminates the wish from consciousness altogether and cuts it out of the conscious mental field of wish-fulfilment. It is out of sight but it is not out of mind and repressed "unconscious" wishes of this kind are very frequently sources of subsequent symptom formation.

CASE J.—An example of this kind occurred in a patient aged 29, who stated that at the age of 23 she was raped by her father. She was able to give full circumstantial details without exaggeration and in a most impressive way which, had they been given in a court of law, and in the light of his known moral character, might well have secured her father's conviction. She had at this time spent about three years in a mental hospital suffering from a very serious nervous breakdown, attributable, as she said, to the shock. Her first breakdown had in fact dated from the age of 23, and her history showed that she had not been well since that time. After she left the mental institution, improved but uncured, she was seen as an out-patient twice a week at the Tavistock Square Clinic, and it became increasingly plain that if the episode which she said was the cause of her illness had actually occurred, it was in fact no more than a coincidence, because it represented her lifelong ambition, although it had never been fully conscious. She was of a very religious disposition—in fact, over-conscientious—and such an idea was quite intolerable to consciousness. She had been a lifelong enemy of her mother, and her most frequent dreams involved her mother's death. There had been many minor episodes of intimacy in which her father had played an unwise part, unaware of what the consequences were likely to be.

She had many symptoms, but only one will be given as an example of repression and fulfilment of the unconscious wish. She said that she wished to count everything in fours. This had originated, as far as she remembered, when at 14 she had tried whilst lying in bed, to fit the tiles of the roof across the road, four at a time, inside the four panes of her bedroom window. This was a period of great emotional strain with regard to her father, and was not in fact the beginning of her tendency to count in fours, as she remembered later that as a very small child she liked her doll to have its eyes half-shut, so as to have two lids and two eyes and so make four. She interpreted this symptom entirely of her own accord, saying that she was not at all sure that it was right, but that it had just come to her like that. She said "If I start with the figure 4 I feel that this

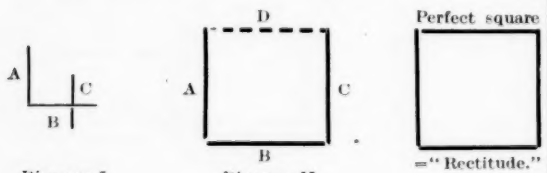
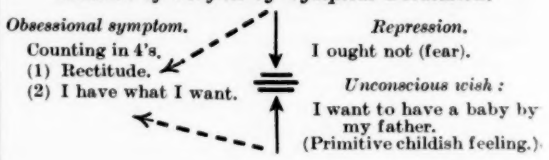


Diagram I. Diagram II.

(A in Diagram I.) is my father, this (B) is my mother, and this (C) is me. What I want to do is to go like this. That is my father (A in Diagram No. II.), that is my mother (B), that is me (C), and then I want to make a perfect square (dotted line D)—and this is what I *want*. I feel that this is something to make everything complete—like I wanted a baby when I was a little girl, and I feel that the square is something which is quite right and proper, and nothing wrong with it at all."

In phantasy, the patient had always wanted a baby by her father and she obtained it unconsciously through her obsessional symptom of counting in fours and squares, but she obtained it in such a way as to combine it with a symbol of conscious moral rectitude.

Solution of Conflict by Symptom Formation.



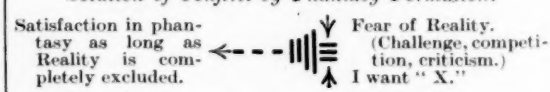
RATIONALISATION.

Rationalisation is the term applied to the satisfactory conscious explanation of wishes and behaviour derived from unconscious sources and unsatisfactory to consciousness. The extent to which this mechanism can take place is almost infinite because of the freedom of the conscious thinking process to arrive at any conclusion which may be satisfactory to itself, which it then embroiders and believes to be true, because it likes it to be so. Most of our thinking suffers from rationalisation—i.e., it is not what is really true, but what we would like to be true. When we are most sure, we usually have least grounds for our assurance, but most wish to be sure. Rationalisation therefore is a process of conscious elaboration and wish-fulfilment. It enables us to prove what we wish to prove and explain in the way that we like, what we should be afraid to explain in a way that is true.

In the case cited above, the patient's consciousness had rationalised her own self-deception by saying that her father had raped her, and that that was the cause of her breakdown. It was only after several months of treatment that she came in a great state of emotional disorder to say: "Doctor, it is not true—he didn't do it." Her unconscious wish had entered consciousness and from that time it lost its power to control her.

PHANTASY.

Solution of Conflict by Phantasy Formation.


Satisfaction in phantasy as long as Reality is completely excluded.
Fear of Reality.
(Challenge, competition, criticism.)
I want "X."

Another way in which the conscious wish may be gratified is through phantasy. The essential point in phantasy is that it must at all costs avoid reality. We can achieve in phantasy the wish that is impossible of achievement in reality and which, if achieved in reality, would be intolerable. For instance, the child's longing for power and self-importance makes him play the part both of field-marshal, and of editor of the popular press which he has created to exploit his doings. Either of these achievements in reality would involve him in a degree of hard work and responsibility which would be intolerable. If the habit of phantasy is continued his capacity for real achievement will become progressively less. Phantasy is the same as day-dream. Both are an escape from the irksome reality of everyday life. Its material may be the same as imagination, but phantasy is essentially different from imagination in that, whereas phantasy must remain dissociated from reality, imagination may be a means towards achieving it. When phantasy becomes real, it is always met with disaster. We should all like to believe that the girl of our dreams is the most beautiful girl in the world, but to see what corresponds to that phantasy in the front row of the chorus and to marry her is to court disaster.

The following is an example of phantasy occurring in a male homo-sexual, aged 23, and represents a

day-dream of wish-fulfilment, which was fortunately dissociated from reality.

"I would have a very famous school, which would be for consumptives, arranged so that they could be naked all day long. I should start with a few boys in a Clinic, who would get on so well that we should become world-famous, so that eventually I would have about 1200 boys who would all be naked. We would have a magnificent building with a fine Chapel surmounted with a Golden Cross, and the motto would be 'The highest and the best.' The boys would sleep naked under ultra-violet light, with their eyes shaded. We should do observations on them as to the effect of frequency of semination upon their work. Semination and homo-sexuality would be encouraged in order to add to the joy of school life, thereby encouraging the power of love. The boys would grow up to be the most important men in the Country and they would look up to me as being the most important of all. They would get into all the places of power and responsibility and would eventually become members of parliament, so that I should be elected as Prime Minister and be the most important person in the world."

Summary.

The conception of "purpose" is essential to understanding the dynamic aspect of modern psychology. Purpose is not necessarily *conscious*, nor is it limited even to *mind*, as was shown by examples of purposive behaviour in the body in conditions both of health and disease.

Not all the "behaviour" of the tissues and parts of the body in disease is purposive, however. Some, of which tremor is a simple example, is only secondary to, or resultant from, a deeper cause. In the latter case, symptomatic treatment, if necessary, is justified. In the former, however, the purposive nature of the behaviour must be remembered, and treatment must remedy the cause. Such purposive disorders are far more commonly found in psychological medicine, and yet in the past they have been treated almost entirely symptomatically, with results necessarily disappointing.

The personality as a whole has certain primary needs, which are sought *purposively*, though not necessarily *consciously*. Most important amongst these are Love, Protection, and Power. These may, under certain circumstances, be achieved through illness and development of symptoms, in which case the illness is wished for not as an end in itself, but as a purposive means to a desired end.

Man is more than the sum of his own experience, and his behaviour is often motivated by past primitive and childish wishes, which are not tolerated by his higher reason and conscience. They are therefore "repressed," but still remain dynamically active, and therefore give rise to "conflict," and often to subsequent symptom formation.

Consciousness is all of which we are aware, but does not contain all our motives. Consciousness as a whole, however, is unified in the way that pleases its own standards by "rationalisation." It therefore looks deceptively complete, and this deception is itself purposive in affording both a self-justification and an organised simplicity and unity. "I am quite sure" usually only means "I want to be sure." Rationalisations are therefore liable to be defended with great emotional intensity, and the latter is usually indicative of the existence of the former.

Purpose or wish fulfilment may evade reality altogether, and achieve the desired end in "phantasy," which is pathological because it is at the expense of a flight from reality. Adaptation is wish-fulfilment through reality, and phantasy is false adaptation. Being a proposive detachment from reality it is a fundamental factor in the development of insanity.

SPECIAL ARTICLES

POST-VACCINAL ENCEPHALITIS.

A REVIEW OF RECENT DATA.

IN an appendix to a further report of the Committee on Vaccination, just issued, appears a translation of a report by Sir George Buchanan presented in May last to the permanent committee of the Office International d'Hygiène Publique. This report has been designed to bring out the principal observations which have been received by the Office International since the expert conference at The Hague in 1926 on the incidence and character of post-vaccinal encephalitis. The countries chiefly affected are the Netherlands and England.

The Netherlands.

Dr. Jitta estimated in May, 1929, that 146 cases had occurred in Holland and that recent data in 1928 pointed to a ratio of 1 case per 5000 vaccinations, with a fatality of 1 in 3. In August, 1929, variola was imported into Holland and energetic measures were taken to secure vaccination on a large scale. At least 77,354 vaccinations and 1,196,465 revaccinations were reported, and these figures have been taken as a basis. There were 52 cases of encephalitis after primary vaccination and 31 after revaccination; of the former group 14, or 26·9 per cent., died, on an average five days after the appearance of the disease, which occurred on the eleventh or twelfth day. The incubation period was shorter after revaccination. Although 16,000 infants under 1 year of age were vaccinated, there was no case among children less than 12 months old. There was one case among 3487 children vaccinated between 1 and 2 years of age, and one case among 815 vaccinated between 6 and 11 years of age. There were 32 cases after revaccination, most of them in persons over 12. The lymph came from Holland itself and three scarifications were made, each ½ cm. long and 2 cm. apart. There was no certain relation between the intensity of the local reaction after vaccination and the occurrence of encephalitis, and in no case was there anything like a generalised vaccinia.

England.

During 1926 and the first nine months of 1927, 40 English cases were considered and 15 of them were eliminated. In the two subsequent years 108 cases were reported and 90 of these were considered to be post-vaccinal encephalitis. During these two years about 576,000 primary vaccinations and 293,000 revaccinations were performed with Government lymph, but during 1929 an unusually large number of vaccinations were done with lymph obtained from commercial firms, and the total number is probably about a million and a half. Of the 90 cases, 54 were in children of 5 to 15 years of age. As had been noticed previously, some large and populous communities where plenty of vaccination was being done entirely escaped encephalitis, while there was a notable grouping of cases in other similar areas. There were four instances of familial incidence, and one case in each family died. The youngest patient was 1 year and 8 months old and the oldest 55 years.

Forty-seven patients recovered completely, but one woman had not completely recovered after six months. There were 42 deaths, of which 28 occurred within a week of the onset and all but one of the remainder within three weeks.

It is therefore possible to say definitely that in Holland and England post-vaccinal encephalitis is essentially a disease of children primarily vaccinated between 5 and 15, although it is not confined to those years and has occurred in revaccinated cases. It would therefore be expected to occur in countries where children are not customarily vaccinated for the first time until they are of school age. It is, however, almost certain to be missed unless the attention of the public health authority is called to the need for its thorough investigation.

Outside Europe.

There is no record of encephalitis in Asia and Africa, despite the enormous numbers of adult vaccinations. Even though the vaccinated individuals might not come under medical attention after the vaccination, it cannot be without significance that no case of encephalitis was heard of after, for instance, 15 million vaccinations in Bengal in 1928.

A special search of the mortality and morbidity statistics of Canada since 1921 has not raised any suspicion of post-vaccinal encephalitis in that country, and it has been observed very rarely indeed in the United States, where a large proportion of the primary vaccinations are performed at the sixth or seventh year. Apparently only 20 cases are on record, and these were of the usual type. No case has been reported in Mexico in the last five years. Central America and South America have no record of a case, although small-pox and vaccination are both common.

No case has been recognised in Australia and there are grounds for believing that this is not due to any oversight. There has, however, been no small-pox during the last two years and the number of vaccinations has therefore diminished, those performed being usually on infants of less than a year old.

Continent of Europe.

In Germany, during the years 1927 to 1929, there were 50 certain cases with 15 deaths. Most of the vaccinations are done in May, June, and October on children of 2 years of age, and most of the cases occurred during these months and in children of that age. The period of incubation appeared to be 11 days. During the three years 1927 to 1929 there were six cases after revaccination and all of them died. In four of the cases no scar from the primary vaccination was visible. In Austria there were 65 cases with 15 deaths after primary vaccination and 7 cases with 3 deaths after revaccination during the years 1925 to 1929. No cases of post-vaccinal encephalitis proper have been notified from Spain, but certain meningeal symptoms were considered to have been connected with the use of neuro-vaccine. Primary vaccinations in Spain are nearly always carried out before the age of 6 months. The data are also negative from Greece, though special attention has been called to the subject and about 800,000 vaccinations were done during 1928 and 1929. Primary vaccination is rarely done in France between the ages of 5 and 15 and, although much attention has been given to post-vaccinal accidents, no case of encephalitis has been reported from 86 departments; of six suspected cases in the four other departments, only two seemed to be genuine. There are no cases known in Belgium or Italy, probably again because vaccinations are usually done on infants.

Norway reports on 28 cases since 1921, 16 of them between the ages of 5 and 10, with 15 deaths. In Sweden the first case was reported at the end of 1927, and compulsory notification was ordered at the beginning of 1929. During that year three cases occurred and two died. The law requires that children should be vaccinated before the end of the sixth year, and they are therefore usually done as late as possible. It has been noted that nervous disorders are not rare after measles, chicken-pox, mumps, and whooping-cough.

No fresh case has been reported in Switzerland since October, 1928. Vaccinations are rare in German Switzerland, and in the French cantons are compulsory before the end of the first year. Between 1921 and 1926 there was an epidemic of small-pox, and between one and one and a half million vaccinations were performed on older children. Five cases of encephalitis resulted in children between 6 and 17 years of age, and there was one death. In Roumania vaccination is regularly done during the first year of life and again at school age and no case has ever been observed, although a special look-out has been kept. The same applies to Poland, except that two cases were reported in 1926. In Portugal no cases occurred during the years 1928 and 1929. The Soviet Republic is taking steps to study the matter very carefully; one case was reported in 1928 and another in 1929, and between eight and nine million vaccinations are done every year. The first case in Jugo-Slavia occurred in 1929 after a primary vaccination at the age of 3½.

Pathology.

The English Committee on Vaccination has prepared a commentary on the histological study of 25 typical cases. Its findings accord with those in other countries. The characteristic lesion is a perivascular demyelination affecting in particular some of the vessels of the white matter of the brain and cord, and attended with certain definite tissue reactions among which the inflammatory ones are often the least obvious. The lesions are remarkably symmetrical. They may be found after comparatively trivial acute infections, and the problem is not confined to post-vaccinal encephalitis alone. There is urgent need to find some other method of protection against small-pox, as has already been done in the case of rabies. Subacute disseminated sclerosis and acute disseminated encephalomyelitis have many pathological features in common, although they can be clearly differentiated, and recently Pette in Germany has described a case which seems to occupy an intermediate position between them. Attempts to find a virus transmissible to rabbits and monkeys have been invariably negative. Kling in Sweden demonstrated some round or oval bodies which he regarded as protozoa, but he does not wish to make any decisive statement.

The rapporteur's impression is that this complication of vaccination is a characteristic clinical entity, having a parallel in the encephalitis which may follow acute infectious diseases, and that it is most desirable that fuller data should be obtained about *encephalitis post-infectionem*. His review, while showing that post-vaccinal encephalitis is an important practical problem, enphasises the rarity of its occurrence and supports the view that it should not be allowed to diminish the confidence placed in the use of vaccination.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

HEALTH IN THE UNITED PROVINCES.

REPORTS such as that on the health of the United Provinces for 1929, which is now before us, furnish a rejoinder to agitators who charge the present régime in India with callous indifference to public health. The United Provinces of Agra and Oudh, with their population of over 45 million people, can be taken as a fair example of what is being done elsewhere. The area concerned measures about 107,000 square miles. Figures are given with the qualification that registration of vital statistics and reporting of epidemics are defective; but efforts are being constantly made to effect an improvement, and records are more trustworthy than they were 20 years ago. The provincial birth-rate was 24·3 (35·3), the death-rate 24·2 (25·0), the quinquennial average being given in parenthesis for comparison. Infantile mortality is given as 168·6. There are, of course, marked variations in different regions; for instance, the general death-rate was as low as 15·2 in Gonda district, and as high as 75·8 in the city of Lucknow; and infantile mortality varied between 116·3 and the terrible figure of 469·2, Lucknow again holding the high record. It is satisfactory to note, however, that the general death-rate for infants shows an almost uninterrupted decrease from the decennial average for 1901–10, which was 255·0. As might be expected, the urban areas show a much higher rate than the rural—275·7 for the decennium as contrasted with 157·7. The chief causes of mortality are given as "fevers," cholera, plague, respiratory diseases, dysentery and diarrhœa, and small-pox, in descending order of frequency Fevers claimed 810,583 victims, this number being somewhat less than the quinquennial average, and on the rough diagnosis available the overwhelming majority of these deaths were due to malaria; 77,000 were credited to "other fevers," 12,000 to measles, 8000 to enteric, and only some 300 each to relapsing fever and kala-azar.

The Himalayan foothills, and the great marshy district of the Tarai below, which come into the U.P. boundaries, are hotbeds of malaria. Antimalarial work is being carried out on energetic lines, including the filling in of tanks, the re-alignment of canals, and the draining of swamps. School cinchonisation has been extensively employed and its results are shown in a much diminished spleen-rate and in an increase of 20 per cent. in the school attendance figures during the two malaria seasons. The free distribution of cinchona tablets in villages has also had its effect in diminishing mortality and spleen-rate, and even in increasing the birth-rate. Cholera accounted for 50,924 deaths, the ratio being 1·12 per 1000 of population, as contrasted with a quinquennial average of 0·68. This disease is a specially grave problem in the U.P., owing to the fact that several of the great fairs are held within its borders, and that the district of Garhwal is traversed by the pilgrim route to the Himalayan shrines of Badrinath and Kedarnath. In these areas special cholera schemes have to be worked out. During the year under report cases occurred along the Garhwal pilgrim route, but they were kept well under control, and only 39 deaths were registered there. Pilgrims who left the route, however, carried the infection into the interior, where the disease took on a severe epidemic form. Wherever it occurred cholera was dealt with by the usual commonsense quarantine measures, by inoculation (of 93,000 persons), and by the permanganating of wells. The emergency medicinal treatment consisted of kaolin and a mixture of essential oils. From plague there were 37,678 deaths in 1929, as compared with 80,943 in 1928—a welcome decrease. Inoculation is employed, and 131,320 people were inoculated, as contrasted with more than three times as many in the previous year, when there was more call for it owing to the greater prevalence. An intensive campaign of rat destruction was carried on in some cities; more than 400,000 rats were destroyed by one municipality, mostly by trapping. Under the head of small-pox 11,725 deaths were returned, as contrasted with 3012 in 1928, a number almost twice that of the quinquennial mean. In the best vaccinated provinces bad years will occur, but a chart which is given to show the relation of vaccination to small-pox over a number of years ought to convince the most hardened antivaccinator. During this year 1,374,372 primary vaccinations were performed, and of these 94·7 per cent. were successful. Of children under one year 56·1 per cent. were successfully vaccinated. Only one case of encephalitis following vaccination was reported. A vaccine institute is maintained to supply glycerinated lymph.

A large number of travelling dispensaries were in operation during the year and found to be very useful, and the village aid dispensaries in connexion with schools are well spoken of. So popular have they become that the number, which amounted only to 154 in 1928, has now risen to 1199. In connexion with them elementary hygiene is taught, and an attempt is made to get the people to clean up their villages. A feature of the U.P. health service is the provincial hygiene institute, with which is combined the laboratory of the public analyst. The institute is evidently a very live concern. It carries out routine work, such as clinical bacteriology and water examination; conducts classes for the diploma in public health; undertakes the training of visitors in connexion with maternity and child welfare work; and is concerned with investigations of various kinds, and the preparation of material for public health propaganda, including the production of cinema films. One of the institute's most useful functions is the investigation of malaria epidemics, of which it has at present a large programme in hand. The importance of team-work of this description can hardly be overstated.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

PUBLIC HEALTH IN THE FREE STATE.

THE annual report of the Department of Local Government and Public Health of the Irish Free State for 1929, which has recently been issued, contains much interesting information. It is stated that a county medical officer of health has now been appointed in 15 counties. (This number has been much increased since the period covered by the report: there are only four or five counties in the State which are still without county medical officers of health.) Medical inspection of school-children was in operation in Dublin, Cork, and Clonmel, and in the counties of Cork, Kildare, Offaly, and Louth, and arrangements were being made in the cities of Limerick and Waterford and in many of the remaining counties. The first inspections of the school-children have revealed a high rate of decaying teeth, enlarged tonsils and adenoids, and defective vision, while all forms of

tuberculous deformities and conditions of crippledom are fewer than anticipated. Dental caries, the most common physical defect, was found in over half the children examined. Eleven per cent. were found in need of the services of an ophthalmic surgeon, and 18 per cent. had enlarged tonsils and adenoids. An increasing number of areas have made use of the School Meals Act. Infant mortality is diminishing, especially in Dublin county borough. Concurrent with this is a diminishing mortality among children between 1 year and 4 years of age. Three county boroughs and 21 counties have adopted schemes for the welfare of the blind. Arrangements for the prevention and treatment of tuberculosis have progressed, but there are still many patients suffering from the disease who do not come within the influence of the measures taken to prevent or cure it. The principal epidemic diseases reported during the year were: Scarlatina (1148 cases), diphtheria (989 cases), enteric fever (304 cases), and typhus (29 cases). Attention is drawn to the continued retention in the county homes of a considerable number of mentally defective persons and of unmarried mothers.

THE LATE DR. HERRON.

Dr. Robert Thomas Herron died on Dec. 30th at his home in Armagh in his sixty-seventh year. He was educated at the Royal School, Armagh, and received his medical education in Dublin, Edinburgh, and Durham. In early life he was associated with many branches of sport and was one of the best sprinters of his time. He was for many years a member of the Tynan and Armagh Hunt Club, and frequently rode his own mount at point-to-point meetings. He was a clever surgeon and was medical officer for the Armagh Board of Guardians, His Majesty's Prison, the Military Depôt, Macan Asylum for the Blind, and Shiel's Institution. Dr. Herron served in the South African War and retired with the rank of major, holding the 1901–02 medal, with four clasps. He also served in the late war. A man of culture, a physician of versatility and resource, a sportsman, a prime mover in every social work, his genial presence will be long missed in County Armagh.

PANEL PRACTICE

A Report on Insurance Practice.

AT a meeting of the Paddington Medical Society to be held at the Great Western Hotel, Paddington Station, next Tuesday evening at 8.45 P.M., a report on national health insurance practice will be presented. The report is the outcome of about a dozen meetings in which a number of practitioners resident or in practice in the Paddington area have taken part. The matters discussed include: (1) a definition of a "normal service" to be rendered in respect of any given capitation rate; (2) the encouragement of the insurance practitioner in the performance of additional and special services beyond the range of this normal service; (3) the difficulties connected with medical certification and, particularly, a statement of causes of increased certification which it is suggested explain the problem and place it to a great extent outside medical control; (4) remedies for the purely medical agents in the causation of excessive certification and prescribing; (5) modifications of administrative and disciplinary control designed to improve the working of medical benefit and the status of the insurance practitioner, and modifications of the terms of service designed to bring the remuneration into more definite relation with the obligations imposed.

The report is local in the sense that it represents the views of a group of practitioners in Paddington. But it should prove of interest to other insurance practitioners in London who will be welcome at the meeting. Copies of the report in printed pamphlet form may be obtained for 2*s.* 6*d.* on application to the hon. secretary of the Society at 23, Westbourne Park-road, London, W.2.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lts. H. E. M. Martin and R. L. G. Proctor to be Surg. Lt.-Comds.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg.-Comdr. J. B. Ronaldson, V.D., to be Surg.-Capt., and Surg. Lt.-Comdr. J. Lorimer, V.D., to be Surg.-Comdr.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Cols., having attained the age for compulsory retirement, are placed on retd. pay: F. S. Irvine, late R.A.M.C., and L. N. Lloyd, late R.A.M.C.

Lt.-Cols. and Bt. Cols., from R.A.M.C., to be Cols.: Temp. Col. A. C. H. Gray, vice Col. L. N. Lloyd, and D. Ahern, vice Col. F. S. Irvine.

Lt.-Col. O. Ievers to be temp. Col.

Maj. (temp. Lt.-Col.) W. F. M. Loughnan to be Lt.-Col., vice Lt.-Col. and Bt. Col. D. Ahern

Maj. (temp. Lt.-Col.) J. J. O'Keeffe to be Lt.-Col., vice Lt.-Col. and Bt. Col. (temp. Col.) A. C. H. Gray.

Lt.-Col. J. D. Bowie, Reg. Army Res. of Off., to be Maj., whilst re-empld. under Art. 507 (b), Royal Warrant for Pay and Promotion, 1926, and relinquishes the rank of Lt.-Col.

Maj. and Bt. Lt.-Col. A. D. Fraser to be temp. Lt.-Col.

Maj. A. Irvine-Fortescue to be temp. Lt.-Col.

TERRITORIAL ARMY.

Lt.-Col. (Bt. Col.) P. J. Gaffikin to be Col. and to be A.D.M.S., 44th (Home Counties) Div., vice Col. C. W. Ponder vacated.

Capt. D. Ross to be Bt. Maj.

Capt. A. D. Rope (late R.A.M.C.) to be Capt.

N. H. Leslie (late Offr. Cadet, Aberdeen Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

Supernumerary for service with O.T.C.—Lt. R. J. V. Pulvertaft (late R. Sussex R.) to be Lt. supern. for serv. with Med. Unit, Univ. of London. Contgt., Sen. Div., O.T.C.

ROYAL AIR FORCE.

Wing-Comdr. W. Tyrrell to be Group Capt., and Squadron Leader K. Biggs to Wing-Comdr.

Flying Officer D. D. Watson resigns his short service commission.

MENTIONED IN DESPATCHES.

The name of Capt. A. M. Simson, R.A.M.C., lately attached Sudan Defence Force, has been brought to notice by the High Commissioner for Egypt and the Sudan for distinguished services rendered in connexion with the operations in the Nuer country during the period between Dec. 8th, 1927, and Feb. 7th, 1928.

COLONIAL MEDICAL SERVICES.

The following appointments have been made recently by the Secretary for the Colonies: Dr. G. S. Escoffery, Medical Officer of Health, Jamaica; Dr. H. D. Cronyn, Medical Officer, Kenya; Dr. J. G. Slimon, Health Officer, Malayan Medical Service; and Dr. C. H. Howat and Dr. J. J. I. Phelan, Medical Officers for Tanganyika Territory and Zanzibar respectively.

West African Medical Staff.—Dr. A. J. Johnson, Medical Officer.

HONORARY SURGEONS TO THE KING.

Lt.-Col. J. McPherson, I.M.S., and Maj.-Gen. J. D. Graham I.M.S., C.I.E., have been appointed Honorary Surgeons to the King.

EXTENSION OF BRENTWOOD HOSPITAL.—This institution is about to be enlarged at a cost of at least £10,000 by remodelling the executive offices and building a new horse-shoe block on the garden. The enlargement is necessitated by the growing pressure upon accommodation.

PUBLIC HEALTH SERVICES

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of Belfast and Salford :—

Name of city and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Belfast .. .. (415,151)*	21·4	15·6	1·40	1·05	4·3	1·9	112/33	67	5·3
Salford .. .. (235,600)	16·6	15·4	1·32	1·32	5·0	1·1	125/—	68	3·8

* Census of 1926. Notified stillbirths per 100 live births—Belfast 2·9, Salford 4·3.

Belfast.

Dr. Charles S. Thomson took over the duties of medical superintendent officer of health on March 1st, 1930, and in his first report submits a comprehensive survey of the public health activities of the city which he hopes will be a foundation for subsequent reports. His first impressions are that Belfast has no serious slum problem and no grave housing question. It is also fortunate in its large number of parks and open spaces. He judges that overcrowding is relatively small, and bases this opinion both on the census returns of 1926 and the experience of his staff derived from visitation for various public health reasons and for routine house-to-house inspection. The water-supply was satisfactory in quality and quantity during 1929, and the possibility of shortage during an excessively dry summer will be removed by the completion of the large reservoir in the Mourne mountains during the next few years. Some of the many rivers and streams in the city are liable to pollution and remedial steps are being taken. Improvements of the sewerage scheme are in progress. In 1897 there were 27,000 privies ; now there are only 284, mostly in unsewered outlying districts. The scavenging system is being improved on up-to-date lines. Only 44 smoke observations were made in 1929, but it has been arranged to take 104 observations in each of the four divisions of the city during the current year.

The many satisfactory features of the city from the point of view of environmental hygiene make Dr. Thomson optimistic as to the future, if attention is paid to the principles and practice of public health, domestically as well as municipally, and a determined effort is made to educate the public in the matter. There would seem to be no justification, environmentally for example, for the high infant and tuberculosis mortality rates. A scheme for dealing with the former, outlined in the report, includes the appointment of a whole-time medical officer, nine additional health visitors, the establishment of several new centres either to replace those in unsuitable buildings or to serve districts unprovided for, a large increase in free milk for children, and the establishment of an orthopædic scheme.

Salford.

Dr. H. Osborne reports that there was an increase of 65 in deaths from whooping-cough, of 149 from influenza, 165 from bronchitis, and 99 from pneumonia, as compared with 1928. Infant mortality increased from 106 to 125 mainly owing to an epidemic of diarrhœa. Diphtheria was more prevalent, 678 cases with 39 deaths. The type was more severe. Nearly all the cases were admitted to hospital and the case-fatality was 6·4 per cent. The medical superintendent of the hospital, Dr. W. Edge, was asked to immunise the staff at the Salford Royal Hospital, and about 20 general practitioners accepted the invitation to see the methods adopted. Dr. Edge also conducts immunisation clinics at two centres, but the response is only small as yet. A "bed isolation" ward was established at the hospital in January. 165 cases were admitted and there was no case of cross infection. The up-to-date X ray apparatus has been a great aid to diagnosis at the dispensary.

No great reduction in the tuberculosis mortality in Salford can be expected, Dr. Osborne says, until there is a vast improvement in housing conditions. He issues hundreds of certificates to overcrowded families applying for Corporation houses, but in most cases without avail ; 3000 houses are needed to rehouse the tenants of slums, but further housing provision is also needed to relieve overcrowding. The Health Committee can take no action for overcrowding in the 312 houses let in lodgings, and it is obvious for lack of space that the new houses needed cannot be built in the city.

A noteworthy feature of the report is the account of the first two years' working up to March 31st, 1930, of the municipal "ad hoc." V.D. clinic. Judged by every test it is an unqualified success. Since the removal from the Salford Royal Hospital the new cases have multiplied fourfold and the attendances tenfold. The staff is being increased to meet the extra work. About half the patients come from outside areas. Thirty-five per cent. of the new cases are non-venereal. The clinic is at the disposal of patients all day and every day. The new cases for last year numbered 2172, but the V.D. medical officer, Dr. E. Tytler Burke, will not be satisfied until they reach 3000. The proportion of females to males for syphilis is 1 to 3·4 and for gonorrhœa 1 to 5·9. This may be compared with 1 to 1·6 and 1 to 4·0 respectively for the country as a whole. Dr. Burke is clear that their scheme does not yet touch a sufficient number of women. Less than half the new cases were early syphilis—i.e., from primary sero-negative to late secondary. An investigation of the occupation of the new male cases shows that 10·3 per cent. are engaged in road transport and that 16·3 per cent. are seamen. Dr. Burke considers that the growth of mechanical transport with long journeys by lorry drivers has given rise to a problem on shore similar to that of the sailor. He suggests that provision should be made for the comfort of these men during their long journeys. He goes on to point out the danger of accidents when, as quite commonly happens in his experience, the drivers in charge of vehicles are suffering from grave syphilitic disease of the brain and spinal cord. In May, 1930, the Manchester Watch Committee brought forward a proposal to institute a medical test for such drivers. With regard to defaulters, these numbered in 1928–29 33 per cent. and in 1929–30 36 per cent. The follow-up letter to 720 defaulters brought no reply from 38 per cent., and in 23 per cent. was returned as wrong address. Nearly 30 per cent. resumed treatment. The male in-patient accommodation of six beds is inadequate, and Dr. Burke recommends 50 beds for men, women, and children at Hope Hospital, Pendleton. The establishment of a local branch of the British Social Hygiene Council for propaganda purposes is urged. The clinic is recognised by Victoria University as a teaching establishment and the post-graduate lectures were attended by 40 general practitioners.

The designated Milk Order is regarded as a dead letter, the price charged for milk from tuberculin-tested herds being prohibitive. Eighty per cent. of the milk sold is pasteurised, but not according to regulations. Of 453 mixed milks 9·7 per cent. were

tuberculous. The milk from Cheshire farms gave a percentage of 10·8 and from Lancashire farms of 9·4. No improvement is expected until routine veterinary inspection is adopted and the farmers notify their cases. The public analyst urges the need for standards for certain classes of foods, notably jam and cheese. Among the interesting samples culled from his report are :—

A home-made jam contained 42 parts per million of sulphur dioxide, artificially dyed, and made from imported pulp; two samples of lemon cheese put up in small glass jars tied with parchment paper in imitation of a home-made article (one contained 38 per cent. of water and only 5 per cent. of butter, the other contained no butter but 18 per cent. of margarine); a diabetic flour which proved to be ordinary whole flour; a sample of malt extract and cod-liver oil, containing 3·3 per cent. of cod-liver oil by weight.

An important development of the maternity and child welfare scheme was the opening of two new centres, "admirably suited to their purpose," the first being opened in February by Dame Janet Campbell.

A REVIEW OF SCHOOL MEDICINE IN 1929.

A SURVEY of the reports of school medical officers, many of which have received separate no ice in this column, shows a general tendency for education authorities to follow the lead set in the most progressive areas, so that developments like orthopædic schemes, and those dealing with rheumatism, open-air instruction, and even stammering classes will soon come to be usual instead of exceptional. More attention, too, has been directed to sanitation and hygiene of school buildings, many of the newest erections being models of what a school should be.

Another feature of the year was the increased attention given to the pre-school child. The dictum that the elementary schools are "receivers of damaged goods" is being taken to heart, and many reports—e.g., Eccles, Colchester—deal at length with measures taken to prevent damage to the goods. Thus the coördination and coöperation between the school medical service and the general public health, notably the section that deals with maternity and infant welfare, has become more intimate. One step in this direction has been the joint appointment of medical personnel, one or more of the school doctors being also part-time officer of the infant welfare centre. In some county areas the new medical officer of health for a district has been appointed also to inspect the local schools, or the assistant to the county M.O.H. has been allocated to school work. School nurses who are public health visitors see the children at all ages, and school treatment clinics have been thrown open to pre-school children with proved benefit, especially in cases of squint and orthopædic defect. Further, there has been a beginning of the wider development of nursery schools and of nursery classes in the elementary schools.

The spirit of team-work is also seen in the practice, now almost universal, of including in the report of the school medical officer that of the organisers of physical training. Their activities are closely associated with those of the orthopædic staff; as physical culture becomes more fully recognised as an integral part of education, the less will be the need of formal corrective work and surgical treatment. Several medical officers discuss the report of the Departmental Committee on the mentally defective, and the findings of Dr. E. O. Lewis. The main lesson has not been overlooked—viz., that the mentally defective are closely associated in origin with the backward and subnormal, and these are more numerous and more important—for they are more improvable and better worth improving. The fact is brought out by many investigators that the backward usually have high intelligence quotients, and owe their troubles largely to defects such as deafness, malnutrition, and neurosis. For all of these they need specialised medical care, but nothing has been done to organise such classes under the supervision of expert medical officers; all that has happened as yet has been an arrest in the provision of new special schools for the mentally defective. As in previous years, there is still far too little accommodation for the epileptic, and scarcely any, apart from London, for victims of encephalitis lethargica.

Research has been carried on to the benefit of those engaged in it—senior medical officers (e.g., Notts) have emphasised this activity as an antidote to the stagnation of routine inspection—and to the advantage of school hygiene and of medical science as a whole. Subjects like the warming and ventilation of school buildings, on which valuable information has been obtained (Torquay, Brecon), are mainly of interest to those concerned, and the merits of ultra-violet ray therapy and artificial sunlight (Leeds), and of special window glass (Smethwick, Glasgow) appeal to a limited medical circle, as do indeed the valuable studies of overstrain and fatigue in scholars and in teachers (Leicestershire, London). Inquiries, however, into rheumatic heart disease (London, Bristol, and others), into the treatment of enuresis (Kent), and of otorrhea (Notts) are worthy of general attention.

Several medical officers find comfort in looking back over the changes that they have seen in the last two decades. Verminous children were formerly so numerous and their condition so bad that visitors thought of an elementary school as a place of horror; now there are some schools without a single verminous child, and even when, as in the majority, there are a few cases, they are so slight as to need close inspection to detect them. Similarly, though progress in healthy dentition is less rapid, it is becoming rare to find a badly septic mouth in a school-child, and the percentage of children with clean mouths and sound teeth is steadily increasing (Sheffield, Cambridge), though many authorities still need increased dental staff. And, with the signs of progress and development of facilities, there is evident a widening conception of the scope and purpose of school medicine, passing on from the removal of defects and care for the weakly to the education of the children in personal and social hygiene, nabling them to develop their physique to its full potential capacity, and through the training of future parents to raise the level of national health in years to come.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 27TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 135 (last week 138); scarlet fever, 1567; diphtheria, 1107; enteric fever, 13; pneumonia, 1022; puerperal fever, 33; puerperal pyrexia, 88; cerebro-spinal fever, 8; acute poliomyelitis, 3; acute polio-encephalitis, 1; encephalitis lethargica, 8; continued fever, 1; dysentery, 10; ophthalmia neonatorum, 50. No case of cholera, plague, or typhus fever was notified during the week. The general lowness of the figures reported during a holiday week cannot be taken as indicating any diminution of infectious disease.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 30th–31st was as follows: Small-pox, 218 under treatment, 3 under observation (last week 167 and 4 respectively); scarlet fever, 1852; diphtheria, 2082; enteric fever, 16; measles, 98; whooping-cough, 131; puerperal fever, 22 (plus 8 babies); encephalitis lethargica, 121; poliomyelitis, 2; "other diseases," 63. At St. Margaret's Hospital there were 12 babies (plus 1 mother) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 59 (1) from measles, 11 (2) from scarlet fever, 15 (2) from whooping-cough, 33 (8) from diphtheria, 57 (10) from diarrhœa and enteritis under two years, and 59 (15) from influenza. The figures in parentheses are those for London itself.

Seventeen deaths from measles occurred at Liverpool, 9 at Bristol, 8 at Hull, 4 at Grimsby, 3 each at Birmingham, Cardiff, and Swansea. Four fatal cases of diphtheria were

reported from Liverpool, 2 each from Ilford, Smethwick, Coventry, Derby, and Manchester. Diarrhœa accounted for 6 deaths at Birmingham and at Liverpool, 3 each at Birkenhead and Manchester.

The number of stillbirths notified during the week was 216 (corresponding to a rate of 51 per 1000 births), including 21 in London.

DIPHTHERIA IN SMETHWICK.

An epidemic of diphtheria in this county borough has severely strained the available accommodation. The number of notified cases began to rise about the middle of September, and from the week ending Sept. 13th to that ending Dec. 27th 168 cases were reported, the highest number in any one week being 26, during the week ending Dec. 20th. The epidemic arose in the most densely populated ward of the borough where overcrowding renders the isolation of contacts difficult or impossible. The type of infection has been severe, for the most part faucial; in three laryngeal cases tracheotomy was performed. There have been 19 deaths during the period mentioned, a case mortality of 11·3 per cent. The 24 beds reserved for diphtheria cases in the local isolation hospital were quite inadequate, but the neighbouring authorities of Birmingham (where the prevalence is not excessive) and West Bromwich were able for some time to deal with the excess cases. As the epidemic spread, accommodation was increased by emptying the tuberculosis pavilion and opening another ward for diphtheria, thus increasing the number of beds to 45. At the present time all these beds are full and a number of Smethwick patients are being treated at Birmingham, West Bromwich, and Halesowen and Stourbridge Joint Isolation Hospital. The usual precautionary measures were adopted and a propaganda campaign to induce the public to seek protection by toxoid-antitoxin inoculation is having good success. Considerable numbers are being immunised at the welfare centres, school clinics, and at the public health department.

The Registrar-General informs us that the certified cause of death of the boy belonging to Dagenham U.D. (see THE LANCET, Dec. 27th, 1930, p. 1429) was: (1*a*) acute myocarditis due to (*b*) diphtheria; (2) smallpox, not vaccinated. No post-mortem.

OBITUARY

AMY HODGSON, M.D., D.P.H. Liverp., M.R.C.P. Lond.

Dr. Amy Hodgson, who died in London on Dec. 19th at the age of 45 years, had devoted herself without stint to the welfare of babies and children. The daughter of Joseph Uttley Hodgson, she was educated at Liverpool High School and University, qualifying there in the middle of the war period and taking the higher distinctions at a later date. After acting as house physician to the Liverpool Royal Infirmary, she became a recruiting medical controller of Queen Mary's Auxiliary Corps, and was mentioned for her services. In 1921, after taking the D.P.H., she was assistant medical officer of health at Huddersfield. A study of vitamin deficiency in relation to the development of rickets, published in our columns at this time, was of a type commoner now than it was then. After a survey of the work of Mellanby, Corry Mann, Dalyell, and others, and an analysis of 120 cases of rickets observed at infant welfare clinics in Liverpool, she came to the conclusion that there must be some common determining factor, unrevealed by ordinary clinical or bacteriological evidence. Dr. Hodgson herself believed she had found sufficient indication of a lowering of alkali reserve in cases of active rickets. Her later publications were of a more general character. She resigned her appointment at Huddersfield to take a resident post at the Infants Hospital in Westminster, combining this with charge of a welfare centre at Caversham-road and a clinical assistantship at Great Ormond-street.

Dr. Eric Pritchard writes: "I first met Dr. Amy Hodgson in 1922, when I entered into correspondence with her about her work in Liverpool on acidosis in children and its association with rickets. Subsequently, I invited her to take part in a discussion at a London medical society on the same subject, and on this occasion, knowing her resourcefulness and many-faceted knowledge, I made her a tentative offer to come to London and help me to reorganise the Infants Hospital, to which I had just been appointed medical director. At that time the fortunes and prospects of the hospital were not very bright, partly on financial grounds and partly owing to the disrupting effects of the war. Although at that time Dr. Hodgson was assistant medical officer of health at Huddersfield under Dr. S. G. Moore, enjoying a comfortable salary and congenial work, she welcomed my proposal as an opportunity of engaging in the clinical work which attracted her, although it meant financial sacrifice. There was then no residential staff, no pathologist, and no dispenser at the hospital, but the prospect of fulfilling all these offices had no terrors for her. She faced all difficulties and triumphed over them and, in spite of many routine duties, still found time to pursue in the research laboratory the investigations on acidosis begun in Liverpool. In September of the following year, when improved resources made it possible to appoint a resident medical officer, Dr. Hodgson became registrar and pathologist, which post she held until the end of 1926, when she was taken seriously ill and resigned her connexion with the hospital. From this illness she never properly recovered, although she made heroic efforts to take up the threads of her work elsewhere. Had she enjoyed better health I feel assured that she would have made a considerable name for herself as a pædiatrician."

EDWARD HENRY BALDOCK, M.R.C.S. Eng.

Dr. Baldock, who died at Whitchurch, Herefordshire, on Dec. 22nd, after a short illness, had retired two years ago from a busy practice in Hereford extending over 24 years. Qualifying M.R.C.S. from Guy's Hospital in 1891, he went out to Korea as medical officer to the Customs and to the British Legation at Seoul. After his marriage to a Canadian medical graduate, he travelled, with his wife, in China and Japan, where they both rendered medical service during the Boxer trouble and the Russo-Japanese War. Returning to England in 1904, he succeeded to the practice of Dr. J. B. Fitzsimons at Hereford, becoming city police surgeon and medical officer to the isolation hospital. During the war he was one of the superintendents of the Beechwood Convalescent Hospitals. In many directions, social and philanthropic, he was supported by his wife who was for 15 years a poor-law guardian. Both were keen musicians, Dr. Baldock being an accomplished violinist and a leading member of the local orchestral and choral societies.

CORRESPONDENCE

FIBROSITIS: ITS CAUSATION AND TREATMENT.

To the Editor of THE LANCET.

SIR,—The importance of the causation and treatment of fibrositis has been clearly shown by the paper by Sir Thomas Horder at the Chelsea Clinical Society,[1] and the speeches which were made by some of those present. It would not be advantageous in the space at my disposal to discuss all the possible causes of fibrositis, but as there appears to be a doubt in the minds of some as to the value of bacteriological examination and treatment, I am sending this record of my personal experience which should be helpful.

In 1926 I travelled through from London to Cannes by the usual route, and arrived there about midday on Jan. 19th. There was nothing unusual to mark the journey and my health appeared to be normal on the day of arrival. On the following morning, after a good night's rest, I awoke about 7.30 feeling that my hands were uncomfortable. They were both generally swollen and stiff, but not painful. The swelling was œdematous, most marked about the joints of the fingers, and in the palms of the hands, and there was little difference between the two hands. There was no redness but slight tenderness, and I was able to dress slowly without assistance. Temperature about 100°–101°, pulse 70–80, somewhat irregular. As there was no improvement in the general condition of slight fever, whilst palpitation was readily induced, the advice of a medical friend was obtained a few days later, who diagnosed it as "rheumatic gout" or "gout." During a stay of six weeks in Cannes there was some improvement in the general swelling of the hands, but it became more evident that the flexor ligaments of the fingers (not thumbs) and the palmar fasciæ were the most affected. The general health was indifferent, there being frequent cardiac palpitation on exertion and also when sitting quietly. The medicine prescribed relieved the general malaise, but did not arrest the palpitations. The temperature became normal after the first ten days. After return to town, although no cause was to be discovered, treatment was of advantage inasmuch as it relieved symptoms but did not effect improvement in the appearance of the joints, whilst the palmar fasciæ were becoming more typical of the condition recognised as Dupuytren's contraction. Some months later, progress being unsatisfactory, it was suggested that bacteriological examination should be made of the intestinal ejecta. This was done and a variety of Morgan's bacillus isolated. From this a vaccine was made and two injections given, at an interval of seven days. Improvement followed, and became more evident after a third injection. The general health improved, palpitation no longer caused trouble, and the swelling of the hands and joints diminished, leaving the fingers somewhat flexed. Meanwhile the fasciæ of the palms of the hands showed some irregular, nodular thickening with contraction especially on the right side. Here was an instance of so-called "rheumatic gout," which was really a fibrositis of the ligaments of the fingers and palmar fasciæ followed by a typical "Dupuytren's contraction" of the palmar fasciæ. The fact that it was arrested, and unpleasant symptoms cured, after discovery of its bacterial origin, is of much interest to me, especially as it was a personal experience.

[1] THE LANCET, 1930, ii., 1399.

In 1893 THE LANCET[2] published a paper for me on Some Unusual Conditions of the Hands. In that communication, after mentioning a very advanced case of Dupuytren's contraction, I ventured to express my agreement with the suggestion made previously by Mr. William Anderson in his Hunterian Lectures at the Royal College of Surgeons,[3] who when discussing the causation of this form of contraction of the palmar fascia, suggested the possibility of bacterial infection. Not long after my paper was published I received a letter from an eminent physician (dated April 9th, 1893), which is still in my possession, in which the following comments were made:—

"Long-continued observation has convinced me of the fact that Dupuytren's contraction is a disorder almost, if not entirely, confined to persons of gouty inheritance . . . when I speak of gout I am not thinking of uric acid. The bacterial theory of Dupuytren's finger, &c., I believe to be utterly absurd."

It is not often that one can confirm so definitely the value of a suggestion, as in this instance that of Mr. Anderson, and my case shows the importance of a more regular and thorough bacteriological examination. Dupuytren's contraction is a very crippling deformity and one in which surgery has not yielded results which can be considered satisfactory. The desirability for publication of this observation is strengthened by the following paragraph in the recently published third edition of one of our best known works on surgery,[4] in which, when speaking of this form of contraction of the palmar fascia, it is stated:—

"In some instances this is hereditary, while there is no doubt that a gouty or rheumatic tendency plays a part in it; many other causes have been assigned to it, such as syphilis and local septic infections, but there is no evidence of these."

I am hoping that the institution of the special clinics for the treatment of "rheumatism" will do much to differentiate the diseases now grouped under this heading. An early and thorough investigation, even in comparatively mild cases, should include a bacteriological examination, not only of probable causes, such as suppurating discharges, but also of intestinal ejecta.[5] Unless this is done there will be many cases which will not be properly treated before the changes in, and surrounding, joints are intractable and crippling.

I would like to see the results of the full bacteriological examination of a series of the sufferers from lumbago and sciatica. I have seen pyorrhœa satisfactorily treated in a case of painful joints with some swelling and slight temperature, but relief was not obtained until after X ray examination had revealed an abscess at the apex of a tooth which was apparently healthy, and this tooth was extracted. Rapid recovery followed. Again, in a case of fibrositis with limited pyorrhœa this was regarded as the cause, and treatment carried on for months with but slight improvement. A variety of Morgan's bacillus was found when search was made for it, but the patient is left with deformed and stiffened hands and feet, which localised treatment has alleviated but to a limited extent.

I am, Sir, yours faithfully,

WILLIAM HY. BATTLE.

Harley-street, W., Jan. 3rd, 1931.

[2] THE LANCET, 1893, i., 781.
[3] THE LANCET, 1891, ii., 57.
[4] Romanis and Mitchiner, 1930, third ed., p. 691.
[5] See also Fibrositis, Drs. Clayton and Livingston, THE LANCET, 1930, i., 1423.

ACUTE MYELOGENOUS LEUKÆMIA.

To the Editor of THE LANCET.

SIR,—The interesting cases recorded by Dr. Easton in your issue of Dec. 27th, 1930 (p. 1394), are so valuable a contribution to the subject that I am tempted to break a friendly lance with him over the interpretation thereof. The cases which Dr. Easton describes are all good examples of acute myeloblastic leukæmia. In this group the predominant initial symptom is always a sloughing throat, and high leucocytosis and enlargement of the spleen are usually absent because death occurs before these have had time to develop. The blood picture, incidentally, is identical with that found in the final stage of myeloid leukæmia of the chronic type.

The conception of septic infection was, I believe, the first explanation put forward of the pathology of myeloid leukæmia; at all events it has appeared on the stage intermittently for about half a century. It is very plausible, but there are many difficulties in its adoption, and I do not feel that Dr. Easton's cases really support the contention that coccal infection is the cause rather than a concomitant of the leukæmia. Apart from the usual arguments that hæmolytic streptococci can be found in almost every sloughing throat, and in the fauces of many apparently healthy people, that infection of experimental animals therewith gives rise to a definite blood picture which is not that of leukæmia, and that if we except the infectious leucosis of fowls which is a disease sui generis leukæmia has never been induced by inoculation, there are some additional points against the infective theory to which I would draw attention.

In normal human beings and in cases of septic infection the administration of a leucocytic stimulant such as sodium cinnamate or nucleinic acid is followed by a polynuclear leucocytosis without primitive forms; in leukæmia no such response occurs. Similarly, the injection of a T.A.B. vaccine gives rise to an increase in the antibody titre to these organisms; in leukæmia this is absent. Primitive granular cells do not appear to be phagocytic or to be capable of forming antibodies. I have frequently used these tests in the diagnosis of doubtful cases of leukæmia. Recently Knott and Watt (*Brit. Med. Jour.*, Dec. 13th, 1930) have shown that the proportion of phagocytic cells in the blood is a valuable guide to the utility or otherwise of deep X ray therapy in the treatment of leukæmia. The explanation of the sloughing throat and other septic manifestations would appear to be that in leukæmia the bactericidal properties of the blood are so markedly diminished that streptococci and any other bacteria gain an easy hold on the patient. Sepsis is, therefore, the result and not the cause.

In practice the conception of sepsis as a cause of leukæmia is not without danger. In a case which I saw in consultation some time ago a dental surgeon was accused of having caused leukæmia by extraction of teeth from a septic mouth. The patient was suffering from acute myeloblastic leukæmia and it was only the blood picture that saved the surgeon from a threatened action by the relatives. We have difficulties enough in coping with the diagnosis and treatment of acute septic infections without having leukæmia added to our pitfalls.

To my mind the chief difficulty in understanding leukæmia lies in the fact that the patients are so seldom seen before the characteristic clinical signs and blood picture are well established, and yet the disease must obviously start, as it were, from scratch. I would, therefore, with Dr. Easton, plead for the publication of more acute cases, and this would be easier if the blood were examined histologically, as it should be, in all cases of acute sore-throat and pyrexia of unknown origin. Until then, however, I advocate research rather than the restatement for which he calls. It is as valuable to determine what is not, as what may be.

I am, Sir, yours faithfully,

A. KNYVETT GORDON.

Bedford-square, W.C., Dec. 27th, 1930.

PASTEURISATION OF MILK.

To the Editor of THE LANCET.

SIR,—As one of the 50 members of the tuberculosis study group which visited Canada this year, the predominating feature to me was the results obtained by pasteurisation. In a document entitled Some Facts Concerning the Tuberculosis Situation in Toronto, given to the group by the Public Health Authorities, there appears the following:—

"Ranking high among the preventive measures employed against tuberculosis is the city milk pasteurising programme, effective since 1914, under the terms of which the total milk-supply with the exception of less than 1 per cent. is adequately pasteurised under official supervision. The very small quantity not pasteurised and sold under conditions warranting its certification as defined by law. *As a result bovine tuberculosis presents no problem in Toronto.*"

I therefore was delighted to see the letter of Lord Dawson and his eminent colleagues. If Colonel Maddock lived in a Utopian country with Utopian cows and farmers, we would agree with his academic letter. Unfortunately, we do not. At Winsley sanatorium we have always pasteurised our milk and they have always done so at King Edward VII. Sanatorium, Midhurst. What we all want is a practical way of reducing tuberculosis and, as Lord Dawson points out, no one wants to put the clock back.

I am, Sir, yours faithfully,

J. D. MACFIE.

Winsley Sanatorium, near Bath, Jan. 6th, 1931.

To the Editor of THE LANCET.

SIR,—One important point has been omitted in the discussion of Lord Dawson's manifesto on the pasteurisation of milk. While it can be admitted that any damage done to the vitamins in the process of pasteurisation can be made good by the addition of concentrates to the diet, it is not so easy to make up for the loss of soluble calcium. The work of Daniel and Stearns has demonstrated that children fed on pasteurised milk exhibit a negative calcium balance in some cases in contra-distinction to children fed on raw or dried milk. Work in this country is being carried out on the gain in weight of infants fed on Certified and pasteurised milk. The children fed on unpasteurised milk show a very definite advantage over those fed on pasteurised milk. Before the profession as a whole endorses this manifesto every precaution should be taken to ensure that the best method of providing a cheap, clean milk for children is provided by the process of pasteurisation.

I am, Sir, yours faithfully,

Bristol, Dec. 31st, 1930. FRANK BODMAN.

A HOME AT SAN REMO FOR INVALID LADIES.

To the Editor of THE LANCET.

SIR,—I want to bring to the notice of your many readers a home for invalid ladies of limited means, who earn their own living, situated at San Remo, Italy, a spot which is considered to have the best

all-round climate on the Riviera. The Villa Emily was built by an English artist for his own use and is a commodious house in a large sheltered garden. All the rooms face south and wide verandas run almost the entire length of the two floors. The object of the institution, which was started over 50 years ago and deserves to be better known, is to provide a comfortable home for ladies in ill-health, who need a winter in a warm sunny climate to fit them once again for their duties. It is under the patronage of Princess Beatrice, is run by an English committee, and is in the charge of an experienced trained matron with trained nurses under her. The home has been extensively renovated and has central heating. Each lady has to pay £2 a week. This sum is quite inadequate to cover expenses and the annual deficit is made up by generous friends. Medical attendance and nursing are given free.

I am, Sir, yours faithfully,

San Remo, Dec. 15th, 1930. L. N. HESKETH BIGGS.

"HAPPY MARRIAGES."

To the Editor of THE LANCET.

SIR,—The question whether most marriages prove, in the long run, happy or unhappy is, nowadays, a popular subject for discussion. The protagonists on each side argue hotly but base their arguments, apparently, either on the broadest generalisations or else on a very limited personal experience. One reads, for example, of a gynæcologist who says that "in his experience" most marriages are unhappy. May I suggest that a specialist is hardly the person to be very familiar with the normal? His work deals entirely with the abnormal. It seems that the general practitioner, who sees a good deal of the families in his practice in health as well as in disease and who knows the intimate secrets which patients do not readily disclose to specialists, is perhaps the only person with sufficient and unbiased knowledge to supply exact information on this subject.

It would, I think, be of considerable value to students of social problems and writers on morals if sufficient data could be obtained. I have recently examined all the names of married couples appearing in the books of my practice and subjected them to a critical analysis. Omitting all those whom I do not know with sufficient intimacy, and also all who have not been married longer than four years, I find there are 188 couples about whose married lives I have definite information as to their happiness.

If these are divided into four groups: (*a*) those who are fundamentally happy; (*b*) those who are moderately happy—i.e., whose happiness depends on the favour of fortune; (*c*) those who are moderately unhappy—i.e., whose unhappiness might be turned into happiness by material circumstances; (*d*) those who are fundamentally unhappy—that is to say, whose unhappiness is incurable and beyond mere material conditions; I obtain the following: (*a*) 50 per cent.; (*b*) 14·5 per cent.; (*c*) 15·5 per cent.; (*d*) 20 per cent. These figures, I should explain, are derived from a middle-class surburban practice.

I should be much interested if others in general practice in different social spheres would supply similar analyses. By such means, and by them only, can definite and fairly reliable information on this interesting subject be obtained. I may add that I was very much surprised by my figures as I had got the impression that most marriages were a failure—which shows the danger of forming opinions on insufficient data!

I enclose my card and remain, Sir,

yours faithfully,

Dec. 29th, 1930. W.

MEDICAL NEWS

Royal College of Surgeons of England.

The following lectures will be delivered at the College at 5 P.M. on the days indicated: Jan. 19th, Mr. Victor Bonney: The Results and Technique of Myomectomy; 21st, Mr. J. Basil Hume: The Pathology of Diaphragmatic Hernia; 23rd, Mr. J. W. Tudor Thomas: Successful Grafting of the Cornea in Rabbits; 26th, Mr. D. H. Patey: The Pathological Basis for the Treatment of Varicose Veins by Injections, and its bearing on the problems of Thrombosis: 28th, Mr. J. Paterson Ross: The Treatment of Cerebral Tumours with Radium, with an account of Experiments made to study the effects of Radium upon Cerebral Tissue; 30th, Dr. Donald Hunter: Changes in the Bones in Hyperparathyroidism and Hyperthyroidism; Feb. 2nd, Prof. H. H. Woollard: The Potency of the Pharyngeal Entoderm; 4th, Mr. T. P. Dunhill: Malignant Disease of the Thyroid Gland—the relation of the incidence and spread to its embryology and prognosis.

University of London.

Prof. Joseph Barcroft, F.R.S., is giving three lectures on the Constancy of the Internal Environment: its Evolution and Purpose, at King's College, Strand, on Mondays, Jan. 26th, and Feb. 2nd and 9th, at 5.30 P.M.—The course of ten lectures on Comparative Physiology to be given by Mr. G. P. Wells, at University College, Gower-street, begins at 5 P.M. on Friday, Jan. 16th.—Prof. G. Elliot Smith, F.R.S., will give a public lecture on the Peking Man at University College on Thursday, Jan. 15th, at 5.30 P.M.—On March 16th and 17th Prof. B. Brower, of Amsterdam, will lecture at University College on the Central Nervous System.

London School of Hygiene and Tropical Medicine.

The course of special lectures given at this school during the autumn will be resumed next week. Particulars will be found in our Medical Diary.

International Congress of Radiology.

The third meeting of this congress will be in Paris from July 26th to 31st. The subjects to be discussed are the radiological examination of the urinary apparatus, and of the mucosa of the digestive tube, the pre- and post-operative treatment of cancer of the breast by radiation (except recurrences and metastases), and radiotherapy and diathermic electrotherapy for inflammatory diseases. The offices of the congress are at 122 rue la Boëtie, Paris VIII.e

Charing Cross Hospital Post-graduate Course.

If enough support is received, the staff of Charing Cross Hospital will hold a post-graduate course at the medical school on Sundays from Jan. 18th. The lectures will be given on ten consecutive Sunday mornings and a fee of one guinea will be charged to cover expenses. Those wishing to attend are asked to communicate at once with the secretary of the medical school, 62, Chandos-street, London, W.C. 2. The first two lectures (on Jan. 18th) will be by Mr. Jennings Marshall (10.30 A.M.) on the Diagnoses and Treatment of Urinary Infections, and by Dr. Everard Williams (11.45 A.M.) on the Antenatal Care of Expectant Mothers.

Neurological Post-graduate Demonstrations.

A series of monthly clinical demonstrations for practitioners will be given at the Hospital for Epilepsy and Paralysis, Maida Vale, W. 9, by the members of the honorary medical staff, beginning on Thursday, Jan. 22nd, at 3 P.M., when Dr. Wilfred Harris will demonstrate. Tea will be provided, and it will be a convenience if those intending to be present will send a card to the Secretary.

Society of Radiographers.

This Society will hold its annual dinner at the Florence Restaurant, Piccadilly Circus, on Friday, Feb. 13th, at 7.15 for 7.30 P.M.

Jugoslavian Radium Institute.

It is announced that the Government of Jugoslavia have decided to establish a radium institute, and have purchased a gramme of radium for the use of the staff.

Hunterian Society.

The Hunterian lecture will be delivered at the Apothecaries Hall, Water-lane, London, E.C., at 9 P.M., on Monday, Jan. 19th, by Dr. Arnold Lorand, of Carlsbad. His subject is the Problem of Rejuvenation. The annual dinner will be held at the May Fair Hotel, Berkeley-street, W., on Thursday, Feb. 19th.

A Conference on Tuberculosis.

The seventeenth annual conference of the National Association for the Prevention of Tuberculosis, which will be held at Margate from June 25th–27th, will be devoted to an all-round discussion on the Protection of the Child from Tuberculosis. Particulars may be had from the Secretary at Tavistock House North, Tavistock-square, London, W.C. 1.

Research in Mental Disease.

In our advertisement columns the Joint Board of Research for Mental Diseases (University of Birmingham and City Mental Hospital Committee) invite application for a scholarship in mental diseases. The scholar will be required to carry out histological investigations in the Board's laboratory and preference will be given to a recently qualified medical man or woman.

Society for the Study of Inebriety.

At a meeting of this society, to be held at 11 Chandos-street, London, W., at 4 P.M., on Tuesday next, Jan. 13th, Dr. Courtenay Weeks will open a discussion on Alcoholic Indulgence in Relation to Motor Transport. On the evening of March 10th there will be a joint meeting with the Section of Psychiatry of the Royal Society of Medicine, when Dr. William Brown, Dr. Macdonald Critchley, Dr. Edward Mapother, and Dr. F. G. Laughton Scott will speak on the Prevention and Treatment of Drug Addiction, excluding Alcoholism.

National Hospital, Queen-square.

A post-graduate course in diseases of the nervous system will be held at this hospital from Feb. 2nd to March 27th. The general course will consist of clinical lectures and demonstrations at 3.30 P.M. each weekday, except Wednesday and Saturday. There will be teaching in the out-patient department at 2 P.M. each weekday except Saturday, and pathological instruction at noon on Monday. Ten lectures on the anatomy and physiology of the nervous system will be given at noon on Wednesdays and Fridays if there are enough applicants, and 12 clinical demonstrations, chiefly on methods of examination of the nervous system, will be given at 5 P.M. on Tuesdays and Thursdays. A limited number of students can be enrolled as ward clerks. Application should be made to the Secretary of the hospital, Queen-square, London W.C. 1.

Hospital of St. John of Jerusalem.

The King has sanctioned the following promotions and appointments:—Commanders: Major A. MacGillivray, Dr. C. D. Henry, Dr. G. Sprott, Mr. Ernest Clarke. Officers: Surg.-Commander H. J. W. Brennand, Major-General J. G. Foster (R.A.M.C.), Dr. J. R. Bulman, Lieut.-Colonel W. H. Fisher, Major-General C. A. Sprawson (I.M.S.), Dr. F. J. Borrie, Major W. H. Borrie, Major J. R. Thomas, Mr. A. K. H. Pollock, Lieut.-Colonel J. S. Elliott, Surg.-Commander A. T. Rivers (R.N.). Associate Officer: Sir Leonard E. Hill. Serving Brothers: Mr. S. A. Wilkinson, Mr. E. H. Knowles, Dr. L. E. Price, Dr. T. C. Tilbury-Fox, Dr. A. M. Robertson, Dr. D. Samuel.

League of Mercy.

The Prince of Wales presided, last week, at the annual meeting of the League of Mercy, at Chesterfield House. It was stated that the income for the year was £31,453, as compared with £26,373 last year. This total, however, includes £5000 received from the British Charities Association, and £1300 from the Thank-Offering Fund for distribution to extra-Metropolitan hospitals. The proposed grant to King Edward's Hospital Fund for London is £17,000. Last year a like sum was granted, together with a contribution of £1000 to the Thanksgiving Fund. The grants to extra-Metropolitan hospitals this year amounted to £12,000; last year they were £8399. The total grant and distributions this year, therefore, came to £29,000, as compared with £26,399 the year before. Since the League was established, £596,000 has been distributed to hospitals throughout the country.

Donations and Bequests.

Among other bequests, Dr. James Macfee, Colonsay House, Auchterarder, left £3000 to the Porth Royal Infirmary.

Mrs. Olive Robertson Watson, M.B., has been appointed a member of the Board of Trustees for the National Galleries of Scotland.

Presentation Beds at Cardiff.

Lord Glanely has presented a bed each to Cardiff Royal Infirmary and the Royal Hamadryad Hospital, of which he is chairman, in memory of the late Lady Glanely. He had previously endowed four beds at the Hamadryad Hospital and two at the Infirmary.

Hospital and Rates.

At the December meeting of the Bognor Regis Urban Council the finance committee recommended that a donation of £36 should be made to the local War Memorial Hospital, this sum being the amount paid to the council in rates during the current year; also that a donation of five guineas be given to the Royal West Sussex Hospital at Chichester.

Nurses' New Year Gift to King's College Hospital.

To prevent the closing of some of the wards of King's College Hospital, Denmark Hill, the nurses, with the help of patients, have collected £646. Lord Gorell, the chairman of the hospital, in receiving the nurses' gift, said the hospital was in a very difficult position at a very difficult time, but he felt that when such self-sacrifice was shown (some of the nurses had voluntarily given up their Christmas dinner to help the hospital's finances) the difficulties would be overcome.

Fees of Paying Patients.

The Cheshire public assistance committee has fixed the minimum charge for private patients at the Chatterbridge Hospital at £3 3*s*. per week, which is double the amount formerly charged by the Wirral Board of Guardians.—In-patients living in the district of Lyme Regis Cottage Hospital will in future be charged not less than £1 1*s*. per week, and children 10*s*. 6*d*. per week, instead of 10*s*. and 5*s*. respectively as heretofore. Out-patients will also be charged a small fee.—The Governors of the Royal Salop Infirmary have decided that, in future, patients who are not contributors to any existing voluntary organisation "shall be obliged to pay according to their means towards the cost of their maintenance."

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Jan. 13th.—5 P.M., THERAPEUTICS. Discussion: The Therapeutic Uses of Iron. 8.30 P.M., PSYCHIATRY. Paper by Dr. Adler (Vienna).

WEDNESDAY.—5.30 P.M., SURGERY: SUB-SECTION OF PROCTOLOGY. Cinematographic Demonstration: Mr. Ernest Miles: Abdomino-perineal Operation. Short Papers will be read. Cases and Specimens will be shown.

THURSDAY.—5 P.M., DERMATOLOGY (Cases at 4 P.M.), Dr. H. MacCormac and Dr. H. W. Barber: Case for Diagnosis. Dr. H. W. Barber: Lupus Erythematosus of the Buccal Mucous Membrane (previously shown). Dr. F. Parkes Weber: Extreme Xanthelasma Palpebrarum. Other cases will be shown.

FRIDAY.—5 P.M., BALNEOLOGY AND CLIMATOLOGY. Clinical meeting at the Red Cross Clinic for Rheumatism, Peto-place, Regent's Park, London, N.W. 8 P.M., OBSTETRICS AND GYNÆCOLOGY. Combined meeting with the Tuberculosis Association: The Management of Pregnancy, Parturition and the Puerperium in Tuberculous Women. Openers: Dr. Geoffrey Marshall and Dr. Melville Hiley (Tuberculosis Association); Mr. Aleck Bourne and Mr. L. Carnac Rivett (Obstetrics and Gynæcology). 8.30 P.M., ELECTRO-THERAPEUTICS. Dr. G. Grant Allan: Radiology of the Heart.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Jan. 12th.—8 P.M., Pathological Meeting.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

THURSDAY, Jan. 15th.—7.45 P.M., Demonstration arranged by Colonel James to illustrate a paper at 8.15 P.M., by Lt.-Col. S. P. James, I.M.S. (retd.), on Some General Results of a Study of Induced Malaria in England (illustrated by lantern slides).

SOCIETY FOR THE STUDY OF INEBRIETY.
TUESDAY, Jan. 13th.—4 P.M. (at 11, Chandos-street, W.), Discussion on Alcoholic Indulgence in relation to Motor Transport. Opener: Dr. Courtenay Weeks.
MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
FRIDAY, Jan. 16th.—8.30 P.M. (in the rooms of the Medical Society of London at 11, Chandos-street, W.) Dr. Alfred Adler of Vienna: The Structure of Neurosis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE. Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Jan. 12th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.
LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (Public Health Division), Keppel-street, Gower-street, W.C.
MONDAY, Jan. 12th.—3 P.M., Mr. C. N. Hooper: The Control of the Marketing of Fish. 4 P.M., Mr. C. Hattersley: Fish Inspection.
WEDNESDAY.—5 P.M., Dr. W. G. Savage: Bovine Tuberculosis.
BRITISH INSTITUTE OF RADIOLOGY (incorporated with the Rontgen Society, 32, Welbeck-street, W.).
THURSDAY, Jan. 15th.—8.30 P.M., Dr. J. F. Brailsford: Hydatid Disease in England. Prof. E. A. Owen and Mr. H. I. Jones: Ionisation Chambers for X Ray Dosage Measurement. Prof. Owen and Mr. Philip Wright, Ph.D.: Physical Characteristics of the Scheidt Ultra-Violet Ray Tube.
FRIDAY.—2 P.M., Medical Visit to Radiological Department of Middlesex Hospital.
UNIVERSITY COLLEGE, Gower-street W.C.
THURSDAY, Jan. 15th.—5.30 P.M., Prof. G. Elliot Smith: The Peking Man.
KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Jan. 15th.—9 P.M., Dr. A. Cogswell: Modern Methods of Anæsthesia.
CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
THURSDAY, Jan. 15th.—5 P.M., Dr. J. A. Willett: Lessons Learned from Emergency Admissions.
CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Jan. 16th.—4 P.M., Mr. F. W. Watkyn-Thomas: The Acute Mastoid.
LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital 49, Leicester-square, W.C.
TUESDAY, Jan. 13th.—5 P.M., Dr. G. B. Dowling: Seborrhœa. Seborrhœic Dermatitis.
THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Ringworm Infections.
SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.
FRIDAY, Jan. 16th.—5 P.M., Dr. Millais Culpin; Neuroses and the Public Health

Appointments

RANGHEAD, J. A., M.B., Ch.B. Glasg., D.P.H., has been appointed Asst. Medical Officer of Health for Dumfermline, and R.M.O., West Fife Infectious Diseases Joint Hospital.

City of London Maternity Hospital: JOHNS, A. W., M.R.C.S., L.R.C.P. Lond., Resident Medical Officer; BROMLEY, J. W., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officer.

Certifying Surgeons under the Factory and Workshop Acts: GLEN, A., L.R.C.P. Lond., M.R.C.S. (Silverton, Devon); GOUGH, J. H. H., L.R.C.P. Lond., M.R.C.S. (Chichester); MCBEAN, J. L., M.B., Ch.B. Glasg. (Cheadle); PRICE, J. T., M.D., B.Ch. Dub. (Llandovery, Carmarthen); TELLET, W. E., M.D., Ch.B. Edin. (Paisley).

Vacancies

For further information refer to the advertisement columns.

All Saints' Hospital, 91, Finchley-road, N.W.—H.S. At rate of £150.
Bedford, Bedfordshire Sanatorium.—Res. Asst. M.O. £400.
Birmingham, Dudley Road, Hospital.—Jun. Asst. M.O.'s. Each at rate of £200.
Birmingham and Midland Nerve Hospital.—H.P. £70.
Birmingham, Queen's Hospital.—Hon. Asst. to Ear, Nose, and Throat Department.
Birmingham, University and City Mental Hospital.—Research Scholarship. £250.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Bolton Infirmary and Dispensary.—Cas. O. At rate of £150.
Bow Institution, 2a, Bow-road, E.—Asst. M.O. £250.
Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Brighton, Sanatorium and Infectious Disease Hospital.—Jun. Res. M.O. At rate of £150.
Brook Fever Hospital, Shooters Hill, Woolwich, S.E.—Asst. M.O. £350.
Cambridge, Papworth Village Settlement.—3rd Asst. M.O. £200.
Carshalton, Surrey, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £350.
Charterhouse Rheumatism Clinic.—Hon. Phys.
Chelsea Hospital for Women, Arthur-street, S.W.—Registrar. £50.
Derby City Hospital.—Three Res. M.O.'s. £200–£250.
Dunedin, New Zealand, Otago Hospital Board.—Radio-Therapeutist. £1000.
Durham, Seaham Hall Sanatorium.—Med. Supt. £600.
Ealing, King Edward Memorial Hospital.—Sen. H.S. Also Jun. H.S. £150.
East London Hospital for Children, Shadwell, E.—H.S. At rate of £125.
Evelina Hospital for Children, Southwark, S.E.—Hon. Dental Surgeon.
Exeter, Royal Devon and Exeter Hospital.—H.P. At rate of £150.
Folkestone, Royal Victoria Hospital.—Sen. and Jun. Res. M.O.'s. At rate of £125 and £100 respectively.
Fulham Acute Hospital, St. Dunstan's-road, Hammersmith, W.—Asst. M.O. £350.
Great Yarmouth General Hospital.—Sen. H.S. £150.
Grosvenor Hospital for Women, Vincent-square, S.W.—Chief Assistant.
Hampstead General and North West London Hospital, Out-Patient Dept., Bayham-street, Camden Town.—Cas. Surg. O. At rate of £100.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. At rate of £50.
Hospital for Sick Children, Great Ormond-street, W.C.—Surg. Reg. £300.
Huddersfield Royal Infirmary.—H.S.'s. At rate of £150.
Hull Royal Infirmary, Sutton Branch.—H.P. At rate of £160.
Ilford, King George Hospital.—H.S. At rate of £100.
Inverness, Royal Northern Infirmary.—H.P. At rate of £100.
Leeds Hospital for Women.—H.S. At rate of £50.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Leigh Infirmary, Lancashire.—Res. H.S. At rate of £150.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool, David Lewis Northern Hospital.—Four H.S.'s and two H.P.'s. Each at rate of £100.
Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. £100.
London Hospital and Dental School, E.—Asst. Dental Anæsthetist.
Maidstone, West Kent General Hospital.—H.S. £220.
Manchester Royal Infirmary.—Jun. H.S. and Cas. O. for Central Branch, Roby-street. £100–£200.
Manchester, St. Mary's Hospitals, Whitworth-street and Whitworth Park.—Four H.S.'s. Each at rate of £50.
Mansfield, Notts, Harlow Woods, Orthopædic Hospital.—Res. Surg. O. £275.
Margate Royal Sea Bathing Hospital, &c.—H.S. At rate of £200.
Middlesex Hospital and Medical School, W.—Medical Registrarship. £300.
National Dental Hospital, Great Portland-street, W.—Hon. Anæsthetist.
Newcastle, Co. Wicklow, Royal National Hospital for Consumption for Ireland.—Jun. Res. M.O. £200.
Northampton General Hospital.—Hon. Asst. Physician.
Nottingham Children's Hospital.—Res. H.S. At rate of £150.
Nottingham General Dispensary.—Res. Surgeon. £250.
Nottingham General Hospital.—Cas. O. At rate of £200.
Oldham Royal Infirmary.—H.S.'s to Special Depts. Each at rate of £175.
Rotherham Hospital.—H.P. £180.
Royal Dental Hospital of London, 32, Leicester-square, W.C.—Hon. Asst. Anæsthetist.
Royal Free Hospital, Gray's Inn-road, W.C.—Gynæcological Reg. £100.
St. Charles' Hospital, St. Charles'-square, Ladbroke Grove, W.—Asst. M.O. £350.
St. George's Hospital, S.W.—Asst. Ophth. Surgeon.
St. Mark's Hospital for Fistula, Cancer &c., City-road, E.C.—Two Anæsthetists. Each £25.
St. Mary's Hospital for Women and Children, Plaistow, E.—Surgeon in Charge of X Ray Dept. £100.
St. Olave's Hospital, Lower-road, Rotherhithe, S.E.—Asst. M.O. £350. H.S. and H.P. Each at rate of £80. Also Res. Med. Supt. £1100.
St. Peter's Hospital, Vallance-road, E.—Asst. M.O. £350.
Sheffield, Royal Hospital.—Ophth. H.S. £120. Also Res. Anæsthetist. £80–£100.
Sheffield Royal Infirmary.—H.P., H.S., Asst. Aural and Ophth. H.S. Also Asst. Cas. O. All at rate of £80.
Sheffield University and Royal Infirmary.—Asst. Pathologist and Demonstrator of Pathology. £500.
Stepney Metropolitan Borough, E.—Part-time M.O.H. for Maternity and Child Welfare Centres. 1 guinea for each attendance.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P., and H.S. Each at rate of £100.
Warrington Infirmary and Dispensary.—Sen. and Jun. H.S. £225 and £175 respectively.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Jun. H.P. At rate of £100.
Willesden General Hospital, N.W.—Registrars.
Windsor, King Edward VII. Hospital.—H.S. At rate of £100.
Wolverhampton Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.
Worcester, County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Strensall (Yorks, North Riding).

NOTES, COMMENTS, AND ABSTRACTS

WOMEN MENTAL DEFECTIVES AND CRIME:

A PRACTICAL STUDY.*

BY LETITIA FAIRFIELD, C.B.E., M.D. EDIN., D.P.H.,
BARRISTER-AT-LAW.

MUCH of the prevalent discussion on problems of mental deficiency is purely theoretical and has little relation to the human material with which it has to deal. It may therefore be of some interest to study one aspect of the question—the relation of mental deficiency in women to crime—from a practical angle, and to inquire how far certain pre-conceived notions are supported by facts. A survey has therefore been made of all the defective women notified to the local authority as having come into definite conflict with the law over the five years 1925–29 in the London area where, as is generally acknowledged, the Mental Deficiency Acts are actively in operation.

The Mental Deficiency Acts, 1913 and 1927, place on the local authority an obligation to ascertain such mental defectives in their areas as are: (1) neglected or delinquent; (2) under the care of the poor-law, having given birth to an illegitimate child; (3) ill-treated by persons in charge of them; (4) defectives under the age of 21 whose parents wish them to receive further training; or (5) children, about to leave a special school, who have been notified by the education authority as needing further care. Where the education authority has faithfully performed its statutory duty of ascertaining which children in its schools are mentally deficient and providing them with a suitable education, the vast majority of defectives in a district will come under the care of the authorities under Clauses (4) and (5)—i.e., before any social disaster has occurred. We are here concerned, however, with the handful of women and girls who came to notice in the capacity of delinquents.

Ascertainment among Delinquents.

The procedure in London is as follows. Any prisoner who arouses suspicion of mental abnormality, either by her behaviour at the time of arrest or in court, or who is already known to the police or probation officer as mentally weak, may on the order of the learned magistrate be remanded in custody for a report on her state of mind by the prison doctor. If the doctor reports that in his opinion the woman is certifiable under the Mental Deficiency Acts, she is on her next appearance in court again remanded in order that the responsible local authority (in London, the County Council) may be asked whether it will accept and deal with the case. The L.C.C. medical officer then visits the prison and examines the defective, and if he concurs in the diagnosis he gives evidence to that effect when the prisoner is again brought before the court. The learned magistrate may deal with the case under Section 8 of the Mental Deficiency Act, 1913—i.e., he may postpone passing sentence and direct that a petition be presented to a judicial authority with a view to obtaining an order that the defective be sent to an institution or placed under guardianship or, in lieu of passing sentence, he may himself make such an order, the latter being the more usual and simpler procedure. This clause applies only to persons convicted of an offence punishable, in the case of an adult, with penal servitude or imprisonment. Section 9 of the Act empowers the Secretary of State to transfer any prisoner found to be defective while undergoing sentence either to any institution where managers are willing to receive them, or to guardianship. This section is useful for such defective prisoners—fortunately rare—as have escaped the notice of the court before or during trial.

For certification the prisoner must come within one of the four categories of the Mental Deficiency Acts—i.e., idiot, imbecile, feeble-minded, and moral defective—and it must be established to the satisfaction of the court that the defect arose before the age of 18 years. The diagnosis of mental status is made by the aid of standardised intelligence tests, some modification of the original Binet-Simon scale, such as Burt's London scale or the Stanford revision. Simple performance tests and other tests such as the Porteous series are also used. Much has been said in ridicule of psychological tests, but without their use the whole discussion of mental deficiency as a social problem would become meaningless. No two persons could agree what class of individuals they were talking about, nor could they convey in words the defective's mental relationship to normal persons. It should be—but is not—unnecessary to point out that the diagnosis is not made by the tests but by the person who uses them. They are servants, not masters. In a recent *cause célèbre* a distinguished alienist was referred to contemptuously by counsel as a "mental certifier." He retorted with dignity, "I am not a 'certifier,' I am a physician," and it is on that basis alone that every doctor should give evidence.

Learned magistrates differ considerably in the evidence they require as to the essential point of defect "before the age of 18"; usually if it proves impossible to ascertain the early history of the patient they accept a statement from the doctor that in his opinion the defect is such that it *must* have existed before 18 years; as an expert witness he is entitled to draw such an inference from his observation of the patient. Nowadays this is rarely a stumbling-block in practice, as the tests at our command are usually adequate to make a diagnosis clear, but the doctor may sometimes be in difficulty over an elderly person of obscure antecedents whose mental enfeeblement might well be attributable to the mild dementia induced by drink and privation. It is important here to adhere to the terms of the Statute, even at the price of occasionally losing hold of a patient who would unquestionably benefit by care and control.

The conditions of the examination are such as to give every possible chance to the prisoner. Recently a magistrate in a case in which I was giving evidence expressed his surprise and pleasure that the prisoner had been seen by two specialists. In fact all prison cases are seen by at least two independent experts, the prison doctor and the L.C.C. medical officer; the notes are discussed by the latter with the head of the department and a further opinion can be obtained if there is the slightest doubt. The prison authorities kindly permit a prolonged interview with the prisoner under most favourable conditions, and the certifying officer has the benefit of information from the experienced staff who have had the woman under observation, and of access to previous records. A school history has usually been obtained by the prison authorities; if not, it is procured later, if at all possible. In London the certifying officers are also dealing with school-children and have access to the schools and all reports on school-children, normal and subnormal. The records of ex-special school-children go back over 30 years.

If the woman is considered certifiable, a trained social worker on the local authority's staff visits or corresponds with the home and with any recent employer or social worker who has had the girl under her care. In fairness to the prisoner, great efforts are made to get a complete picture of her upbringing and career, not only with a view to accurate diagnosis but also to determine whether institutional treatment is necessary. Particular attention is paid to any allegation that she has held good employment or has lived steadily and peaceably under certain conditions. The principle applied throughout is that certification under the Mental Deficiency Acts is as grave a matter for both patient and doctor as certification under the Lunacy Acts; both result in deprivation of liberty,

* Read before the Medico-Legal Society on Oct. 23rd.

and the reasons for such a step ought to be carefully established.

A Five Years' Review of Defective Delinquents.

In the five years under review, 78 notifications of alleged defective women were received from the London magistrates and from the women's prison. Of these, 20 were considered by the prison doctor and the Council's certifying officers to be not defective, while 58 were deemed certifiable. If this average of 11·6 cases per annum in a population of over four million seems extremely low, there is reason to believe that the cause is to be found in the careful ascertainment and preventive supervision of defectives in the London area rather than in any lack of zeal in searching out defective criminals. It should also be noted that the Acts do not cover all mental abnormalities but only those coming within a certain definition. The number of weak-minded and eccentric individuals who come in conflict with the law is, of course, very considerable, but they cannot yet be dealt with under any specific Act.

The *ages* of these 58 women at the time of arrest were as follows —:

Under 20 ..	25 cases.	Under 50 ..	2 cases.
,, 30 ..	23 ,,	,, 60 ..	1 case.
,, 40 ..	6 ,,	,, 70 ..	1 ,,

The fact that almost five-sixths of the whole were under 30 shows that the administrative drag-net is acting effectively. It is, of course, most important in the interests both of the women and of the community to put them under care before they become confirmed in criminal habits, while training may be effective and before they have formed new family obligations. As psychologists have also found in America, mental testing is far from reliable in older men and women of degraded life; these people are most suspicious and inaccessible and, even when their coöperation is secured, it is often hard to say whether poor response is due to amentia or dementia.

The *home background* of the women was investigated wherever possible by visits from a trained social worker, or by correspondence if the girl came from the country. In eight cases the girl had been reared in an orphanage; 16 cases came from definitely bad (not merely poor or ignorant) homes, 29 were from apparently good homes, and information was insufficient for classification in five cases. That exactly half came from ostensibly good homes is surprising, but a little experience of more intensive work with delinquent children has taught me how much mental strife and misery may hide beneath a respectable family exterior. Lack of appreciation of a girl's innate dullness is common, and of itself often causes serious discord and revolt, even in families where other children have been reared successfully. The stories of the little group of ex-orphanage pupils suggested that more attention might be paid to the detection and after-care of defectives in some of these institutions. The large orphan societies are now making very full use of the Mental Deficiency Act for the permanent protection of their charges.

School records were carefully ascertained in every case, either from the teachers or from relatives. It was possible to group the girls into two divisions—i.e., those who were recognised as defectives in childhood by the school authorities and those who were not.

Recognised as Defective.

London girls.	Special school	10		
	Industrial school ..	1		
	"Moral defective" ..	1	14	21
	Too old to have been to special schools	2		
Country-bred girls.	Special school	2	7	
	Elementary school ..	5		

Not Recognised as Defective.

London girls	18	37
Country girls	19	
Attainments below St. II. ..	14	
Above St. II. in reading ..	23	

23 of the 58 had arrived in London less than one year ago.

These figures are probably the most important in this paper. Their most striking feature is the extraordinarily small number of ex-special school girls who get into trouble with the police. For over 20 years London has had a steady population of between 5000 and 7000 children in its special schools for mental defectives, about half of them being girls. Out of the thousands of ex-pupils who must be scattered in the population only ten emerge as criminals in five years. The after-care of defectives is so thorough that I doubt if many cases who have made police-court appearances would be missed, and the test must be considered a fair one. An interesting confirmation of this view comes from Birmingham,[1] where the after-care of ex-special school-children is also very good. In 4813 cases under observation very little delinquency could be found, though the police-court files had been searched for five years. Most of the offences were extremely trivial.

Another group which excites comment is that of 14 who had left elementary school with attainments less than those of a child of 8 (some did not even know a letter) and yet had apparently escaped the notice of the school authorities. Whether they were the victims of foolish teachers who hoped they would "grow out of it," or of misdirected economy which refused to make special educational provision, is not clear. They include, unfortunately, two of the married women convicted of cruelty to their children, whose sad plight need never had arisen if legal provisions had been utilised and preventive care had been given from school-days onwards.

OCCUPATION, PARENTAGE, AND OFFSPRING.

The previous *occupations* of the 58 women were confined to low-class domestic service, factory work, and odd jobs. Six had had no previous occupation but had lived by prostitution and pilfering. The industrial inefficiency of all the women without exception was very marked and was in some cases the determining factor which brought them into the hands of the police. Such unfortunates live a "harried existence," constantly losing jobs for reasons over which they have little real control and constantly at loggerheads with relatives for being unable to keep work.

In view of the statement still frequently made that 50 per cent.[2] of prostitutes are feeble-minded, it is important to note that only 19 of the women, including three married women, had been promiscuous or gravely immoral. An interesting confirmation of this estimate was given by one of the senior probation officers of London who recently told me that "the feeble-minded prostitute has practically vanished off the streets of London, a very different state of affairs from 30 years ago!" It should be added that these poor women seem unable to hold their own in this as in any other occupation, and their stories are pitiful records of exploitation and squalor. Only six of them, however, had suffered from venereal disease.

The *racial aspect* of deficiency is very prominent to-day, and this group of delinquent defectives might be expected to provide sensational figures.

Offspring.—Of the 50 unmarried women nine had borne children :—

6 had borne 1 child each	6
1 ,, ,, 2 children	2
2 ,, ,, 3 ,, each	6
Illegitimate	14

Of the eight married women :—

3 had borne 0 children	0
1 ,, ,, 1 child	1
1 ,, ,, 3 children	3
1 ,, ,, 4 ,, ...	4
1 ,, ,, 5 ,, ...	5
1 ,, ,, 7 ,, ...	7
Legitimate	20

Of the 34 children, eight were dead at the time the mother was arrested. Three only of the children were

[1] Report of the Birmingham Special School After-care Sub-Committee, 1930.

[2] It is significant that most of these figures come from countries where some form of the "maison tolerée" system is in existence. A feeble-minded girl is the ideal occupant of such an establishment—from the point of view of her employers.

known to be defective and the mentality of two more was doubtful, but information was very incomplete, as many of the children were in the care of the guardians or of relatives at a distance. Of the 32 London girls it was possible to say definitely that they had only produced two defectives among their offspring who had attained school age.

Information about *family histories* was insufficient to justify an opinion as to how many of the parents of the 58 prisoners were themselves defective. In at least 20 instances there was evidence of grave social incapacity and moral failure on the part of one or both parents, but he would be a bold diagnostician who would say that such failure in persons usually not seen and often long since dead was due to mental defect. I am aware that diagnoses of this kind are often made and are indeed the basis of much popular "eugenic" lore, but I am entirely sceptical of the value of such pedigrees. An interesting feature of this survey is the light it has thrown on the difficulty and expense of elucidating a "family history" worth the paper it is written on. Careful inquiry has not brought to notice any instance where the parent of a delinquent defective woman was certified, and in only three instances had a sibling been certified or given sufficient evidence in his behaviour to justify a diagnosis of deficiency. The numbers dealt with are so small that the figures have little statistical value, but they are not so unusual as might be imagined.

CRIMES AND CULPABILITY.

The following table shows the *nature of the offences* with which the women were charged and the *mental age* of the culprit.

Mental Age with Relation to Nature of Offence.

Mental age ..	6	7	8	9	10	11	12	Total
Larceny	—	—	8	6	2	3	1	20
Wandering, begging	2	4	1	7	2	1	—	17
Violence to person or property	1	—	—	3	1	—	1	6
Indecency	—	—	1	2	—	—	1	4
Attempted suicide ..	1	—	—	—	—	—	3	4
Cruelty to children ..	—	1	2	—	—	—	—	3
Attempted murder ..	—	—	—	—	1	—	—	1
Infanticide	—	—	—	1	—	—	—	1
Manslaughter	—	—	1	—	—	—	—	1
Murder	—	—	—	—	—	1	—	1
—	4	5	13	19	6	5	6	58

It will be noted that 32 of the 58 fall within the medium grade feeble-minded group—i.e., those who can usually "float" in the population, given good home support and suitable training, but have great difficulty in coping with any crisis on their own initiative. The table bears out the contention that the low-grade defective in London is adequately protected and is not a social danger. The few exceptions here shown are country cases or elderly women who had escaped the care of the Mental Deficiency Acts. Moreover, these imbeciles and low-grades do not contribute illegitimate children. A mental rating of 10, 11, or 12 years in formal tests would not, of course, in itself justify a diagnosis of mental deficiency. Mental tests are, however, not the only touchstone of intelligence, invaluable as they are for providing objective standards by which to compare individuals; in every case in this series the diagnosis has been subsequently confirmed. The 10- and 11-year-old groups here were undoubtedly feeble-minded, but mainly owed their superior rating to the fact that they scored unduly high on verbal tests. The 12-year-old group comprise most of those subsequently transferred to mental hospitals and one victim of encephalitis lethargica. These "12-year-old" women showed a long history of irrational, violent, and incorrigible conduct, without any reasonable motivation and not amenable to training or punishment. Certification under the Lunacy Acts had been considered and definitely rejected as wholly impossible, though it was suspected, correctly, that the mental instability would subsequently develop into a psychosis. Every effort was, of course, made to exclude any cause for their irresponsible behaviour other than innate mental abnormality.

The *culpability* of the prisoners varied very greatly, as it presumably does among their normal companions, and it had little relation to the offence with which they were charged. For example, an old woman charged with the manslaughter of her daughter by neglect proved too confused and ignorant to grasp properly the gravity of her position or even what she was supposed to have done wrong. Two of the three married women convicted of cruelty were in the same situation, and of the same type was an "attempted suicide," a little servant girl (earning 1*s.* a week and her mistress's old clothes) who had decided to end her life in Hyde Park after a domestic row but repented after licking the cork of the lysol bottle. On the other hand, some of the girls were greedy young thieves or prostitutes who definitely preferred snatching a living how they could to any effort at work. Most of them, whether vicious or merely bewildered, were of trivial importance as criminals, and required care and protection mainly for their own sake or that of their relatives. Fifteen of the 58, however, might fairly be described as pests to the community to a greater or lesser degree, while seven of these 15 constitute a group of really dangerous "moral defectives" (though only one was certified as such), each of them worthy of study if space would permit. Four had made attempts at murder and had a long history of irrational violence to persons and property, their victims being usually inoffensive relatives or persons who had befriended them. One of this group of 15 was an encephalitic, who showed very well the typical impulsive tendencies and lack of inhibition with little disturbance of intellectual powers. Four of the others gave rise to strong suspicion (subsequently confirmed by the medical superintendent under whose care they came) that their mental state was definitely psychotic. The border-line between congenital amentia and the schizophrenias is sometimes a narrow one—indeed, the underlying pathological condition may be very similar—and it is not easy to find the appropriate label. All these girls gave a history of a "difficult childhood," sullen, vindictive, irresponsive to affection, with a marked increase of instability at puberty, showing itself in violence, strong sexual or homosexual trends (sometimes in the same individual), and incapacity for settled work and a gradual "retreat from reality" into a world of phantasy. How these girls stand under any legal definition of responsibility is disputable, but it is impossible to deal with them without feeling that lack of ability to bring their actions under the control of reason is due to mental disorder, not to any deliberate fault of the will. That they need care and control for their own good and that of others is certainly beyond argument.

The following case illustrates social disaster brought about by sheer mental incompetence:—

A girl, aged 22, first came to notice when serving a sentence of three months' imprisonment for cruelty to her children, her husband having received a similar sentence. The prison officers had found that she was only capable of understanding the simplest orders and that she had to be treated like a child. She proved to be a blue-eyed, rather pleasant-looking girl, not obviously defective. She did not know a letter, but that had no significance as, like many canal children, she had never been to school. What was more unusual was that she had no idea of number, beyond possibly simple change from a shilling; she could not add 3 and 3. She did not know how long she had been married, or the ages of her children, or when or where her last baby was born! In mental tests she was barely at the 7-year level. Nominally a Catholic, she had had no religious teaching at all. The girl was frank and friendly, and anxious to tell her troubles. She had genuinely no idea why she had been put in prison. "I hadn't no money for milk and I fed it on sop and it cried a lot—and a policeman came and took me away." To all appearance she really loved her babies, and she questioned me eagerly as to when she could go back to them.

On inquiry it was found that her mother was a woman of at least average intelligence who still earned her living on

the barges. Her father was dead. The mother had always thought the girl dull and had not wished her to marry, but the ceremony became necessary when she was 18. After marriage things got worse, and one day, when the baby was a few months old, the mother found her daughter asleep on the towpath in the pouring rain with the infant beside her. Since then she had taken entire charge of that child, but two younger ones had arrived, and the squalor and misery of the barge household became a scandal in that clean-living community. The husband, too, found life intolerable and knocked her about. At last the unspeakable condition of the children compelled the neighbours to intervene. They called in the National Society for the Prevention of Cruelty to Children, who found the child of 2 unable to sit up, and the baby a "skeleton"; both children are thought to be defective, but that is not yet certain.

There was no trouble in dealing with this case under Section 9, but, unfortunately, she proved to be again pregnant. After a brief stay in a convent home she was transferred to the care of the county authorities of her place of residence. The children were taken by the guardians. The husband, who at first said he had no further use for her, now vaguely says he thinks he would like her home, though he knows she could never keep a home for him.

The next case is at the other extreme of intelligence, and shows an example of the strange conduct-aberrations included in the "moral defective" group.

A girl, aged 16½, second of five sisters, was charged with uttering threats to her eldest sister. The first attempt to examine her failed, as she was having prolonged bouts of hysterical screaming. At the second interview she proved to be an attractive, pleasant-looking child who, without asking my name or business, confided her closest secrets at interminable length. The standardised tests, in which she coöperated well, showed her mental age to be nearly 12. Her memory was excellent, her response quick, her concentration good. Her main characteristic was a passionate father fixation, the most intense and overt example I have encountered. She had been his pet up to his death (he had been killed on active service) when she was 7 or 8, and she was encouraged by him to hit the other little girls with impunity. If her mother attempted to control her, the father would knock her down in front of the children. She remained throughout childhood violent-tempered, aggressive, passionately attached to her father's memory, and bitterly hostile to her mother and to the unfortunate elder sister. She admitted to me freely that she had never had anything but kindness from these two, who are amiable and affectionate characters, and the real nature of her feelings towards them remains obscure. At the age of 13 her mother's second marriage brought about a crisis of jealousy; she flung a knife at her and otherwise behaved so outrageously that the mother was obliged to charge her, and the child was put on probation for two years. Under the care of a sympathetic probation officer efforts were made to place her in four homes and four private families, but she had invariably to be removed as violent, quarrelsome, and insubordinate, though capable of good work and very attractive when she liked. Finally, she could not be placed further, and at 16 she was sent home, only to find that the still-hated elder sister had just become engaged. Her own tendencies were homosexual, and she resented this marriage intensely. She behaved so violently that the family were "afraid to go to bed" on one or two nights; she burnt a 10-year old sister's leg with a poker on some trivial provocation, she threw a knife at another sister, and a loaf of bread at her mother who was ill in bed, and she pursued the wretched elder sister with such abuse and threats that the police had to be called in. Even in the police station and in prison she repeated her threats with incredible cold-blooded malice. I pointed out to her that people who killed others were hanged for murder, and this evidently made some impression, for she told a visitor some days later: "I would like to bash my sister's head so that she died *slowly*, and then I wouldn't be a murderer!" She could give me no reason for these amiable sentiments except that the sister was the eldest child, and her mother had given her the father's war medals. She was, I found, truthful, except for a few bombastic lies based on the father complex.

The girl was not amenable to ordinary prison discipline, and, indeed, it was doubtful what purpose such punishment would have served. She was certified as a "moral defective," but it was thought that the condition was at base a psychosis of the dementia præcox type, and this diagnosis was confirmed by the superintendent of the institution to which she was sent. Her conduct improves, but she remains inaccessible to mental treatment, and the prognosis is not good.

The Care of Defective Delinquents.

The disposal of the women certified is, of course, at the discretion of the learned magistrate, who almost invariably, however, accepts the suggestions of the Council's representatives. Some magistrates are still not wholly alive to the preventive value of the Mental Deficiency Acts, and the importance of getting a case under supervision in her own home when institutional care does not seem to be called for. Ordinary probation is not usually a success with defectives, and they cast an unfair burden on overworked probation officers.

DISPOSAL OF CASES (58).

Not considered mentally deficient by the courts (sentenced to imprisonment, 2; bound over, 1)	..	3
Country cases discharged to other local authorities	..	4
Guardianship of parent	..	1
Probation	..	4

(One married, one reconvicted.)

Institutional Care under Mental Deficiency Acts.

Transferred to asylums	5	
Sent to State Criminal Institution	5	
Now on licence	2	
,, on trial in hostel	2	
To guardianship	1	
Escaped	3	.. 46
Died	1	
Temporarily in poor-law infirmaries or hospital	3	
Still in M.D. institutions	24	

It is an old gibe against the Mental Deficiency Acts that they make it possible for a man "to be sent to prison for life for stealing turnips." If the man's theft of the turnip was due to starvation, and investigation showed that his mental incapacity disqualified him from earning his living, it might well be that prolonged—even lifelong—institutional care was the kindest way of dealing with him. The magistrates very wisely consider need for special care and training rather than the actual offence for which the defective came before the court. In the great majority of cases in this series the girls either had no family or the relatives—very excusably—expressed themselves "at the end of their tether" and unable to take the responsibility. It is the best parents who are most anxious for institutional care if their children are in serious trouble. One rule of primary importance is not universally appreciated. Defectives who have shown any sign of giving trouble should never be put under the sole care of a parent of the opposite sex. To this rule there is no exception, and we have many instances of the deplorable effects of ignoring it on sentimental grounds.

The small number of women placed on probation might be disappointing if one did not recall that those for whom such treatment would be suitable are mostly dealt with under preventive schemes for defectives and never reach the courts. In view of the youth of the prisoners at the time of arrest, it may reasonably be hoped that several more will stabilise and eventually be returned to community life. Fortunately, the training offered by the colonies to which the women are sent (especially the State institution for violent and dangerous defectives) is progressive and aims at developing latent capacities and virtues, even in the apparently hopeless.

Sterilisation.

As an immediate treatment for delinquency sterilisation is *ipso facto* excluded, as obviously it does nothing to improve the antisocial behaviour which has brought the defective into conflict with the law. In the neat American phrase: "their offences against the community are not limited to reproduction," and often do not include any tendency towards it. Contrary to the belief of some magistrates, cutting the Fallopian tubes or vas deferens is not a cure for hand-bag snatching. Among those who were ranked as delinquent defectives in my series were the squalidly promiscuous, the homosexual, sufferers from venereal disease, the suicidal, and the potential murderer. None of these persons could be sterilised and turned loose, and it would be grossly unfair and extravagant to subject a person to the risk of an abdominal section if she is to be indefinitely segregated. Sterilisation would not cure the mental incompetence which was at the root of the troubles of other cases.

It is not, I think, appreciated that sterilisation is not now used in the United States as a punishment[3] for delinquents of any kind.

As a preventive measure sterilisation is even more impracticable. It obviously cannot be used for children whose defect is never ascertained, as was the case with many of these women, nor could it be contemplated that local authorities would have the effrontery to sterilise a child leaving school to whom they had not offered a special education appropriate to his needs. Only rarely does moral deficiency as a fixed condition declare itself in childhood, and if the leavers from special schools were to be sterilised wholesale, thousands would have to be mutilated in order to catch the few dozen who become delinquent or the few hundred who bear children. The effect of turning hordes of sterilised adolescents loose in the community requires further consideration before the experiment is tried. Most important of all, no parent would be persuaded to allow a high-grade 7- or 8-year-old child to enter a special school if sterilisation were to be her fate on leaving—or even if a shadow of the possibility of such a fate hung over her. There is no question that the special education of defectives, which is the best preventive of crime, would be most gravely interfered with.

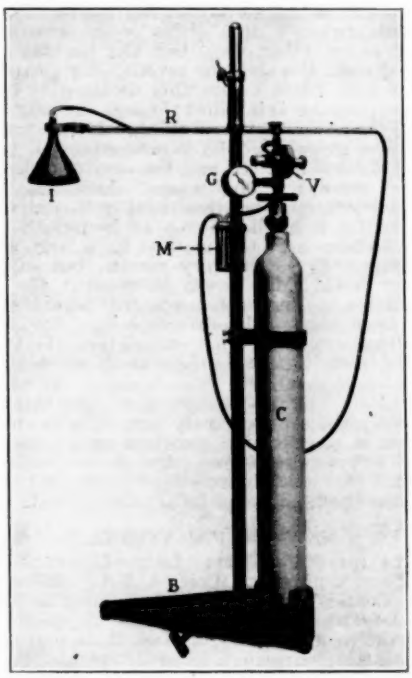
In California the sterilised woman does not cease to be an expense to the community, but is most carefully supervised by trained social workers. She is kept on a string (even if married!) and is hauled back to the institution at the slightest sign of irregular conduct.[4] That is to say, the only benefit that sterilisation could secure is: 1. To prevent the birth of such children as might be conceived before the woman's irregular conduct attracted attention. 2. To enable a woman to marry, without the husband being necessarily aware she had been sterilised. Whether the inculcation of such a philosophy of marriage into the population is likely to raise ideals of family life is another matter. 3. To prevent the birth of more children, as in the case of the one married woman in this series returned to her family. These are literally the only cases to which sterilisation can be applied in the care of the mentally defective, and the result is surely a *ridiculus mus* to emerge from such a mountain of propaganda! A final question which occurs to me with the picture of high-grade patients fresh in mind is this: if they improved sufficiently in conduct to render life in the community socially possible, how could it be subsequently demonstrated to a judge and jury that they were—or ever had been—mentally deficient, and what would be the fate of the doctor who had sterilised them or secured their sterilisation by his certificate?

This brief survey of a group of defectives in the County of London is presented with all the diffidence induced by a knowledge that among a great population many defectives may be missed. It may, however, serve a useful purpose in getting the subject into focus and into a true relationship with the study of delinquency among normal persons. It may also suggest that a frontal attack upon the defective *qua* delinquent is only a very small part of the intelligent handling of the problem of mental deficiency. Early recognition and preventive supervision and training are the best methods of ensuring that subnormal persons shall be assimilated into the life of the community or, if that is impossible, put under conditions happiest for themselves and others.

[3] Gosney and Popenoe: Sterilisation for Human Betterment. New York. 1929.
[4] Gosney and Popenoe. Op. cit.

PORTABLE APPARATUS FOR OXYGEN.

Dr. Lachlan Grant writes: In the vicinity of present-day hydro-electric power schemes it is necessary always to be prepared for the immediate administration of oxygen to cases of severe shock. Mr. G. B. Brook, F.I.C., chief chemist to The British Aluminium Coy., Kinlochleven, after lending out a makeshift apparatus on several occasions, has designed the simple combination shown in the photograph. The oxygen cylinder is easily removed and replaced, although when in position it is held securely. Controls and gauges are in convenient positions and the glass manometer is protected by a small but strong metal cage. The rubber tubing to the vulcanite mouthpiece is threaded through a small metal tube, which is adjustable both vertically and horizontally. The



Portable apparatus for administration of oxygen. R = rod adjustable vertically or horizontally. I = vulcanite inhaler. V = regulating valve. G = pressure gauge. M = indicating manometer, protected by grid. C = cylinder (20 cubic feet). B = base on ball castors.

centre of gravity is adjusted so that the apparatus will not topple over, and the base runs silently on three ball castors, so that it may be brought up alongside the patient or bedside with the greatest ease. When once assembled it can be kept so, and wheeled or lifted about quite handily—e.g., into a car, and can be very easily transported to any part of a country practice.

The entire apparatus can be made up for a few pounds, and the cost of maintenance is almost negligible. Mr. Brook will be pleased to answer any inquiries.

ANTIVIRUS AFTER MASTOID OPERATIONS.

ALTHOUGH recovery after the mastoid operation is nearly always straightforward the patient is, nevertheless, susceptible for the first seven or eight days to complications due to extension of the infective process to the lateral sinus or meninges. With a view to minimising this danger, Dr. H. Grain [1] has made use of Besredka's antivirus [2] applied frequently to the wound, and claims that this is a powerful aid to treatment. He employs a solution prepared from streptococci, staphylococci, *M. catarrhalis*, pneumococci, pneumobacilli, and *B. pyocyaneus*, and his technique is as follows. At the end of the operation a drainage-tube of small calibre is placed at the bottom of the cavity, passing from the level of the antrum to emerge from the lower angle of the wound, and is covered by a packing

[1] Presse Méd., Dec. 10th, 1930, p. 1681.
[2] See THE LANCET, 1927, ii., 73; 1929, i., 1092 and 1157.

of ribbon gauze soaked with the vaccine; above this is placed another tube twice the calibre of the first, perforated with several holes near the end, and long enough to emerge through the upper angle of the wound and to pass above the bandage; superficial to this is a second layer of ribbon gauze, also impregnated with the antivirus, outside which the usual dressings are applied. Ten to twenty cubic centimetres of the antivirus are introduced through the larger tube three times a day for the first two days, and afterwards twice a day. The outer dressings are changed every other day, but the packing is not disturbed until the sixth or seventh day; every half hour for two hours before this dressing 10 c.cm. of hydrogen peroxide is instilled through the long tube to facilitate removal of the packing. If the wound is healthy the irrigation tube is now removed, but the drainage-tube is replaced and the cavity packed with vaselined gauze; if the wound does not appear quite satisfactory, the treatment with antivirus is continued for a further 24 or 48 hours. Dr. Grain appears to have used this method for a large number of patients with satisfactory results, but says that in a few cases it has given no result. He thinks these failures are due to the causative organism being absent from the stock antivirus—e.g., *Streptococcus hæmolyticus* or *mucosus*, or "other atypical microbe"—and he finds local treatment with an autogenous preparation is successful in such cases. It might be objected that complications, such as sinus thrombosis and meningitis, are extremely rare after the mastoid operation in cases which have shown no suspicious symptoms beforehand and that it is precisely in those due to hæmolytic streptococci and to the *S. mucosus* that such sequelæ are commonest.

NEW PREPARATIONS.

PSYLLA (psyllium seed); LACTO-DEXTRIN (Battle Creek Food Company, Mich., U.S.A. Distributing Agents, Coates and Cooper, 41, Great Tower-street, London).—This company have sent us specimens of their laxative agent, Psylla, and their preparation, Lacto-Dextrin, for use in intestinal toxæmia. Psyllium seeds when immersed in water yield a mucilaginous substance which is able to take up relatively large quantities of water to form a gelatinous mass. They become in this way a useful lubricant, while the emollient character of the mass renders it of special service in fissure or hæmorrhoids. The same firm has received favourable reports from the clinical use of their combination of lactose and dextrin.

PEPTALAC; COW AND GATE RUSKS (Cow and Gate, Ltd., Guildford).—Peptalac is pancreatinised milk food predigested by a special process which assists assimilation. The predigestion of food by enzymes is no novelty, but the particular claim for Peptalac is that, with care and the use of a thermometer, a valuable beverage ready for use can be promptly obtained with the medium of hot water. The difficulty of the addition of raw cow's milk of varying composition to foods is thus avoided, as well as the more elaborate processes of preparation entailed by reheating and cooling. At the same time the firm send us a specimen of their Cow and Gate Rusks, which are deservedly well known.

RELAPSING FEVER IN TEXAS.

RELAPSING or African tick fever has not often been seen in the United States, though there was an epidemic in New York and Philadelphia in 1869, and five cases have been reported from Colorado within more recent times. A report of a cave infested with infected ticks now comes from Central Texas.[1] The cave was first explored by four youths who noticed on emerging therefrom that several small ticks were sticking to their legs. These they easily removed, but six days later the boys were all stricken with a fever which rapidly mounted to 103° or 104° F. Other symptoms were malaise, headache, leg-ache, and a persistent sense of chilliness with nausea and vomiting. After these symptoms had continued for four days, a macular rash appeared, and a few hours later the temperature began to decline to the accompaniment of drenching sweats. The first relapse occurred in four to five days and showed the same symptoms, but was less severe and without any rash. The second afebrile period lasted from four to seven days, and was followed by a third period of fever during which actively motile spirochætes were found in the blood. Intravenous doses of neoarsphenamine from 0·4 g. upwards were necessary to cure these patients. Dr. Graham, investigating the cave in which his patients had acquired the infection, became infected himself. The sand on the floor of the cave was found to contain as many as 30 or 40 ticks per handful. These were identified as *Ornithodorus turicata*. Infection of three rabbits with tick juice resulted in the speedy death of two, and in violent and fatal illness for the third after six days' interval. Typical spirochætes were from 18 to 25 microns in length, having from 10 to 15 spirals.

[1] Weller, B., and Graham, G. M.: Jour. Amer. Med. Assoc., Dec. 13th, 1930, p. 1834.

STARK INDIA.[1]

As editor of the *Civil and Military Gazette of India*, Mr. Trevor Pinch saw many things which do not often come to the notice of a casual visitor, and gives us vivid glimpses of Indian life and customs. The account of the flagellations in a Mohurrum procession, and the disastrous Hindu pilgrimage of 1928, in particular, are arresting. A considerable part of the book has a medical interest, and generous tribute is paid to the work of the Indian Medical Service. Perhaps undue stress has been laid on the sex question, prominent as that indubitably is in Indian life. In the section of the book concerned with sex some of the views advanced must be taken with reserve, especially the inference drawn from the story of the beautiful Eurasian girl. That story was current in up-country clubs 30 years ago, and was not taken very seriously.

[1] Stark India. By Trevor Pinch. London: Hutchinson and Co., Ltd. 1930. Pp. 288. 10*s.* 6*d.*

Corrigendum.—On p. 30 of our last issue reference was made to a short survey of "Psychopathology," published by Messrs. Baillière, Tindall and Cox. The author's name is Dr. J. Ernest Nicole and not as stated. We regret the error.

Births, Marriages, and Deaths

BIRTHS.

CLAXTON.—On Dec. 31st, 1930, at a nursing home, Sandgate, the wife of Dr. E. E. Claxton, Folkestone, of a son.

MOSSE.—On Dec. 30th, 1930, at Tsinan, N. China, the wife of Francis H. (Robin) Mosse, M.A., M.R.C.P., of a daughter.

MARRIAGES.

DEBENHAM—HUGHES.—On Jan. 5th, at St. Barnabas Church, Kensington, Robert Kersey Debenham, F.R.C.S., to Kathleen Irene Hughes, daughter of the late W. W. Hughes and Mrs. Hughes.

DEATHS.

ALLEN.—On Jan. 2nd, at Korna House, Woods View-road, Bournemouth, Thomas Allen, Surgeon, of Robin Hood's Bay, Yorkshire, in his 87th year.

HARRISON.—On Jan. 2nd, at his residence, Maysmor House, Chester, Dr. George Harrison, in his 74th year.

JENKINS.—On Jan. 3rd, 1931, John Jenkins, M.R.C.S., L.R.C.P., aged 61, medical superintendent of the Hammersmith Hospital for 25 years, beloved husband of Amy Jenkins.

STANDRING SMITH.—On Dec. 31st, 1930, after a short illness, Robert Charles Standring Smith, M.B., Ch.B., B.A., of Palace-court, W.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ABERDEENSHIRE INFECTIOUS DISEASES HOSPITALS. The public health committee of the Aberdeenshire county council has recommended that, on grounds of efficiency in medical and nursing care, the county's 12 infectious diseases hospitals should be reduced to four—Aboyne, Huntly, Strichen, and Peterhead. The saving is estimated at £3000 a year.